



Trade and Sustainable Forest Management – Impacts and Interactions

Analytic Study

of the Global Project GCP/INT/775/JPN:

***Impact Assessment of Forest Products Trade
in the Promotion of Sustainable Forest Management***

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List of Acronyms and Abbreviations

ADB	Asian Development Bank
AfDB	African Development Bank
AFLEGT	African Forest Law Enforcement, Governance and Trade
AFTA	Asean Free Trade Area
APEC	Asia-Pacific Economic Cooperation
ARD	Afforestation, Reforestation and avoided Deforestation
ASEAN	Association of South East Asian Nations
ATIBT	Association Technique Internationale des Bois Tropicaux
ATL	Accelerated Tariff Liberalization
ATO	African Timber Organization
BDV	Brussels Definition of Value
C&I	Criteria and Indicators
C&L	Certification and Labelling
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
CEPT	Common Effective Preferential Tariff
CERFLOR	Certificate of Origin of Forest Raw Material, Brazil
CFE	Community forestry enterprise
CGTM	Cintrafor Global Trade Model
CIF	cost, insurance, freight
CIFOR	Centre for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO ₂	carbon dioxide
COC	chain of custody
COP	Conference of Parties
CPF	Collaborative Partnership on Forests
CSD	Commission on Sustainable Development (United Nations)
CTE	Committee on Trade and Environment
DESA	United Nations Department of Economic and Social Affairs
DIY	Do-it-yourself
DSB	Dispute Settlement Body
EC	European Commission
ECA	Export credit agency
ECE	Economic Commission for Europe
ECOSOC	Economic and Social Council of the United Nations
EEA	European Economic Area
EFI	European Forest Institute
EIA	Environmental Investigation Agency
EMAS	Eco-Management and Audit Scheme of European Union
EMS	Environmental Management System
ENGO	Environmental Non-governmental Organisation
EU	European Union
EVSL	Early Voluntary Liberalisation
FAO	Food and Agriculture Organization of the United Nations
FCCC	See UNFCCC
FD	Forest department
FDI	Foreign direct investment
FIELD	The Foundation for International Environmental Law and Development
FLEGT	Forest Law Enforcement, Governance and Trade
FLEG	Forest Law Enforcement and Governance
FLONAS	National Forest logging concessions, Brazil
FOB	free on board

FSC	Forest Stewardship Council
FTAA	Free Trade Area of the Americas
G8	Group of Eight (leading economies)
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFTN	Global Forest and Trade Network
GFPM	Global Forest Products Model
GHG	greenhouse gas
GIS	Geographical information system
GMO	genetically modified organism
GNP	Gross National Product
GPA	Plurilateral Government Procurement Agreement
GSP	Generalized System of Preferences
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit GmbH
HPHH	Hak Pemungutan Hasil Hatan concessions, Indonesia
IADB	Inter-American Development Bank
IBAMA	Amazon Environmental Institute, Brazil
ICA	International Commodity Agreement
ICCI	International Conference on C&I for Sustainable Forest Management
IDB	Inter-American Development Bank
IEA	International Environmental Agreement
IEC	International Electrical Commission
IFC	International Finance Corporation
IFF	Intergovernmental Forum on Forests
IHPA	International Hardwood Products Association
IMF	International Monetary Fund
INGO	International Non-Governmental Organisations
IPC	Integrated Programme for Commodities
IPCC	Intergovernmental Panel on Climate Change
IPF	Intergovernmental Panel on Forests
IPPK	Izin Pemungutan dan Pemanfaatan Kayu concessions, Indonesia
ISO	International Organization for Standardisation
ITC	International Trade Centre
ITTA	International Tropical Timber Agreement
ITTC	International Tropical Timber Council
ITTO	International Tropical Timber Organization
IUCN	The World Conservation Union
IWPA	International Wood Products Association
LCA	Life Cycle Analysis
LEEC	London Economic and Environmental Centre
LEI	Indonesian Ecolabelling Institute
LULUCF	Land Use, Land Use Change and Forests
MEA	Multilateral Environmental Agreement
MERCOSUR	Southern Common Market
MFN	Most Favoured Nation
MIGA	Multilateral Investment Guarantee Agency
MOU	Memorandum of Understanding
MTTC	Malaysian Timber Certification Council
NAFTA	North American Free Trade Agreement
NGO	Non-Governmental Organisation
NHLA	National Hardwood Lumber Association
NRRP	Natural Resources and Rights Program
NT	National Treatment
NTB	non-tariff barrier
NTCC	National Timber Certification Council
NTFP	non-timber forest product

NTM	non-tariff measures
NWFP	non-wood forest product
OECD	Organization for Economic Co-operation and Development
OTO	Office of Trade and Investment Ombudsman
P&C	Principles and Criteria
PEFC	Pan-European Forest Certification Framework
PGA	Plurilateral Agreement on Government Procurement
PNG	Papua New Guinea
PPM	production and processing method
PPP	Polluter Pays Principle (other meaning Purchasing Power Parity)
RIIA	Royal Institute of International Affairs
RIL	reduced impact logging
RFE	Russia Far East
RTA	Regional Trade Agreement
RWE	roundwood equivalent
SAP	structural adjustment programme
SFM	sustainable forest management
SGS	Société General de Surveillance SA
SPS	Sanitary and Phytosanitary Measures
SPWP	Secondary Processed Wood Products
TBT	Technical Barriers to Trade
TFF	Tropical Forest Foundation
TFRK	traditional forest-related knowledge
TNC	Transnational corporation
TRAINS	Trade-Basic Indicators of UNCTAD
TREM	trade-related environmental measures
TRIM	Trade Related Investment Measures
TRIP	Trade-Related Aspects of Intellectual Property Rights
UK	United Kingdom
UN	United Nations
UNCCD	United Nations Programme to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Committee on Sustainable Development
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Economic and Social Council
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	Framework Convention on Climate Change of United Nations
UNFF	United Nations Forum on Forests
US, USA	United States of America
USD	United States Dollar
USTR	Office of the US Trade Representative
WB	World Bank
WCMC	World Conservation Monitoring Centre
WCO	World Customs Organisation
WSSD	World Summit for Sustainable Development
WTO	World Trade Organization
WWF	World Wide Fund for Nature

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1. Introduction to the Analytic Study

1.1 Background

The world economy is growing, with rising production and spectacular recent increases in international trade and investment (Maddison 2001; Khor 2000). The GATT/WTO process has paved the road for the globalisation of trade and market dynamics, including the trade in forest products and services. The process has resulted in decreased tariff barriers to trade which in return has increased the volume of trade in all major products. Forest products trade, however, has not been effected by major decreases of tariff barriers, which are generally rather low, but rather by non-tariff barriers, driven by environmental and social concerns.

It is inevitable that an increase in trade results in growing demands placed upon the environment and in particular upon natural resources and their utilisation. Consequently, global climate change, decrease in forest cover and biodiversity loss have become subjects of international concern and multilateral deliberations on how to safeguard these global public goods. While the Uruguay Round resulted in the establishment of the WTO in 1994, a series of intergovernmental processes such as the United Nations Conference on the Environment and Development (UNCED) acknowledged that holistic and comprehensive approaches are needed to foster sustainable development and to form a new global regime of policy making and governance.

International trade has direct and indirect influences on the environment. The indirect influences are commonly perceived to be more important. At the same time, environmental conditions, policies and regulations influence the market access and competitiveness of individual producers of forest products and thus affect trade flows. While trade in forest products is perceived as the major driving force for sustainable management of natural resources, international trade liberalisation and corresponding national macroeconomic policy reforms have led to expanding exports by developing countries, particularly in commodities, thereby increasing pressure on the environment.

Trade based on unsustainable practices in forest operations has been seen as a major factor contributing to deforestation and forest degradation, particularly in developing countries (*e.g.* Dudley 1992, Dudley *et al.* 1995). In a number of tropical countries in Africa, Southeast Asia and the Guyana Shield, export oriented production has apparently accounted for a significant share of forest loss and degradation. In addition to direct impacts, indirect effects, such as opening up forest areas for encroachment, can become or trigger underlying causes of deforestation.

Indirect impacts on deforestation are linked to such factors as changing production and consumption patterns (including expanding demand for food), expansion of subsistence agriculture, demand for fuelwood and charcoal, as well as land tenure patterns. There is increasing pressure on land and water resources for human needs; although 30% of the global land surface is still forested, more than half the original forest area has been lost. Forests continue to be lost at roughly 0.2% per year (FAO 2001).

Given these underlying causes of deforestation, some research findings have concluded that deforestation can only partly be associated with international trade and the process of global trade liberalisation (WTO 1997). The available knowledge and experience on underlying causes of deforestation is still scanty (Tarasofsky 1997). Therefore, the present international dialogue on the interaction between the international trade regime and multilateral environmental agreements (MEAs) continues to be one of the major issues of global interest. This concerns the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the International Tropical Timber Agreement (ITTA), and the Convention on Biological Diversity (CBD). These treaties have been concluded separately from the WTO rules resulting in difficulties of joint application to achieve mutual support and synergies. Since not all countries are signatories to or have ratified all MEAs, there are limitations in the possibility of using MEAs and WTO Rules to define a global regime for trade and conservation and sustainable use of natural resources.

The examination of the relationship between the rules of the WTO and the specific trade obligations of MEAs is an important element of the current implementation of the Doha Development Agenda of WTO and the WTO Committee on Trade and Environment is entrusted to prepare the ground for an improved understanding on the interface between trade and the sustainable use of natural resources, including

conservation of biodiversity. In support of this multilateral dialog, the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002 called for enhancing the mutual supportiveness of trade, environment and development, with a view to achieving sustainable development, and promoting mutual supportiveness between the multilateral trading system and environmental agreements.

Even though the ease, speed and volume of information flows are growing even faster than trade and investment induced by the current trade liberalisation, the interface of trade in forest products and services and forest management is not yet sufficiently determined and the impacts and interactions still ask for a broad range of analysis and research. There mutual agreement that trade based on sustainably managed forests brings socio-economic benefits, thereby creating an incentive for the conservation of forest resources, are laid down in all major intergovernmental documents and strategy papers of international organisations such as the World Bank.

However, such benefits can only be achieved, if environmental and social externalities are being internalised in the cost-benefit calculation of forest operations. Certainly, increased returns on forest investment make the use of forest resources more competitive to alternative land uses such as agriculture (Barbier *et al.* 1993), but the effect of such internalisation of externalities on trade and market access is not yet known beyond the current systems of subsidies in different countries.

With regard to poverty reduction strategies and support to sustainable livelihoods for the rural poor, the value of forests and in particular non-wood forest products and services play a crucial role, even though their international trade has been estimated at US\$ 11 billion only (Iqbal, 1995). Forests in the context of agricultural land-use, forest utilisation of forest-dependent communities and forest services such as water and micro-climate should not be underestimated in their overall importance to the local subsistence production of millions of people in the developing world.

In conclusion, the debate of recent years on the production of forest goods and services, deriving both from natural forests and planted forests alike, has increasingly acknowledged the significant role of the forest products trade and the growing markets for forest services. However, despite numerous efforts by intergovernmental deliberations in various fora as well as in the international NGO community and in the private sector, global structural policies and global governance still need major contributions as to clarify the interactions between production, including its social dimension, trade, environment and economic development as globalisation makes it increasingly difficult to countries and their constituencies to govern the changing global structure and to respond adequately to these changes at the national level. Forestry lies at the intersection of all these concerns and perhaps nowhere are the debates about trade more vociferous, and the opposing positions more entrenched, than with respect to forests and the forestry sector as a whole.

The Government of Japan and FAO agreed in 2001 to implement the research and analytic project entitled "*Impact Assessment of Forest Products Trade in the Promotion of Sustainable Forest Management*". The major contribution of the Japanese Government and FAO's regular programme enabled the Forest Products and Economics Division (FOP) of FAO to set up a project implementation structure which engaged international organisations, the private sector and the NGO community in a project advisors group for substantive contributions in the process, in a peer review group to revise the entire analysis and in various fora and expert panels. The support which FAO received through a variety of international organisations, in particular ITTO, derived from the interest in the issue of trade and sustainable forest management and from the international intention to overcome the fragmentation of debates, dialogs and deliberations on various substantial issues and policies in a variety of fora which often not connect or find difficulties to come to a more mutual understanding of respective imperatives, policy directives and international agreements. Considering the current trends in the international debates and the increasingly apparent conflicting views, the project was implemented very timely as a substantive contribution.

1.2 Objectives of the Analysis

The objectives of this applied research work are to analyse the impacts of trade in forest products and services on forest management and their interactions in the context of changing international trade patterns and market dynamics though globalisation and trade liberalisation. By taking a holistic and comprehensive approach to this analysis, the research work includes a broad variety of issues which drive or limit trade in forest products and services and which impact on forest management or induce changes in forest operations. The analysis only partly touches upon national and sub-national trade and market development

for forest products and services, since domestic conditions vary widely and policy responses by governments need to address need to be very country-specific. However, the analysis fully takes into account those cases, in which national and sub-national markets have a measurable impact on international trade in forest products like China.

Identifying the conditions under which international trade in forest products and services currently develops and taking into account the current international policy debates and recent policy achievements, the analysis focuses on an improved understanding of the interlinkage of trade and forest management based on sound issue-based information and analysis. In particular, current and future policy interventions on the part of government and policy recommendations of major constituencies from civil society and the international community that can influence or could potentially influence the relationship between trade and forest management are at the core of this analysis. To find a path amongst the different interest groups of civil society and the international community, policy makers in trade, forestry as well as other sectors need clear evidence on how trade-related policies affect different groups, e.g. forest investors, employees of forest product companies, local communities, forest landowners and consumers, and how these policies influence incentives to foster to work towards sustainable forest management.

The development of the global and regional trade regime and the international and national efforts in fostering sustainable forest management are closely associated with new challenges in global and domestic governance. One of the objectives of this analysis is therefore the identification of issues, obstacles and best practices with regard to institutional development of governmental bodies, decentralisation of decision making and resource access, in particular for local communities, co-operation mechanisms with governments and civil society, including the private sector, and the establishment of national positions in international trade-related processes based on a national consensus on domestic interests. By addressing governance issues at the international level, the analysis aims to contribute to a more effective steering of the global trade regime considering the diverging and sometimes conflicting views of governments and civil society constituencies from developed and developing countries with regard to national interests and the national sovereignty to manage forest resources, while the joint responsibility of the international community in safeguarding global public goods plays an increasingly important role in the international debate.

The analysis aims to contribute to the current debate on trade in forest products and services and the overall international trade regime by clarifying major issues of common concern. Consequently, the analysis aims to support policy-makers in formulating trade-related policies and responding forest policies that encourage sustainable forest management. The process of this analysis was, however, not closed to the researcher, but FAO offered several fora for debate for interested experts on forestry development and trade in forest products and services as well as trade policy makers and trade negotiators. It was one of the explicit objectives of this analysis to engage a broad range of colleagues from governments, international organisations, the international NGO community and the private sector in this analysis as to provide ground-truthing and a reality check as well as substantial contributions as to improve the collaboration between actors in the international and national deliberations ahead of the international community on the sensitive issue of trade in forest products and services and sustainable forest management.

1.3 Approach and Conceptual Framework

The overall approach to this analysis on trade in forest products and services and its interface with forest management constitutes an applied research exercise consisting of (i) a review of documents and literature, (ii) the organisation of expert consultations and round tables, (iii) the support of a Project Advisors Group (PAG), (iv) the close collaboration with FAO staff and other organisations such as ITTO on a regular as well as the support through a peer review group of international senior advisors from all regions.

This basic approach was chosen as to avoid an elaboration of this analysis in an "ivory tower" situation given the fact that the international debate and many dialogs at the national level currently focus on the interface and the interactions between trade and environment, in particular forestry. The analysis was conceptualised as a contemporary document established by using a holistic and comprehensive approach by (i) summarising the current situation in trade of forest products and services, (ii) analysing the present trends in trade and market development and (iii) elaborating on views of various constituencies and (iv) researching major issues of mutual concern like governance, industrial structure and the role of

environmental services. The analysis should be seen in the framework of governmental deliberations in the different WTO committees like Trade and Environment, Technical Barriers to Trade and Market Access in view of global trade liberalisation.

The study starts by defining sustainable forest management (SFM) tracing the evolution in understanding of the concept. It is clear from this discussion that the divergent perspectives of different stakeholders on forests and on the impacts of trade call for a wider arena of governance across different sectors, including trade, as to increase information flows, transparency on governmental decisions and participation. The study therefore gives particular weight to the various policy debates and the possible coherence of different policies affecting both trade and sustainable forest management.

1.3.1 Methods and Activities

The methods of this research and analysis are based on review of an extensive number of international publications, "grey" literature of different nature, a variety of internal position papers, both of international institutions and the NGO community, as well as meeting reports and working papers. The analysis also draws extensively on personal communications, discussions and other contributions.

Since the research aimed at a contemporary analysis, a Project Advisors Group (PAG) was formed to steer the implementation of this research project (Annex 1). Several meetings were held to discuss substantive issues and modalities of implementation. Members of the group came from international organisations, the private sector, the NGO community and civil society groups as well as a representative of the Government of Japan as the financier of the project FAO GCP/INT/775/JPN "*Impact Assessment of Forest Products Trade in the Promotion of Sustainable Forest Management*".

The distribution of tasks in project implementation was organised in a way that FAO entrusted international specialists to contribute to the research agenda by substantive research and analysis on the various issues at hand (Annex 2 List of contributions and their authors). The basic contribution was provided by the International Institute for Environment and Development (IIED) in London, UK. IIED colleagues also served as resource persons in the PAG.

The *Forest Products and Economics Division (FOP)* of FAO collaborated closely with FAO colleagues from the *Forestry Department*, the *Economic and Social Department (ES)* and in particular the *Commodities and Trade Division (ESC)*. Various meetings were held and contributions provided. The project served as an instrument for better substantive collaboration leading to substantive contributions, verification of the analysis and in-depth comments. This method of collaboration within FAO drawing on in-house expertise was fostered particularly in view of the future work on the issue of trade and sustainable forest management considering the importance of the issue at international and national level.

In order to increase international participation and to exchange views on the issue at hand with wider audience, FAO organised an expert consultation held 3 – 5 February 2003 in Rome inviting specialists from all constituencies and international organisations which are involved in the debate on the interlinkages in trade and environment and/or forestry. The consultation was primarily geared at discussions within the wider forestry community as to increase the mutual understanding in an informal setting (*webpage for the proceedings*):

On 9 July 2003, FAO and the *UN Economic Commission for Europe (UNECE)* invited trade policy makers and trade negotiators to participate in an informal round table in the Palais des Nations in Geneva. Six presentations by representatives of governments, the private sector and the NGO community structured this interesting dialog.

1.3.2 Definitions

Defining sustainable forest management

The broad introduction of the concept of Sustainable Forest Management can be traced to the *Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation*

and Sustainable Development of all Types of Forests, the so-called *Forest Principles*¹ and Chapter 11 of Agenda 21, which were prominent outputs from UNCED. The guiding objective of the *Forest Principles* is to contribute to the management, conservation and sustainable development of all types of forests and to provide for their multiple and complementary functions and uses. Principle 2b specifically states that:

“Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations.”

“These needs are for forest products and services, such as wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products.”

Although the *Forest Principles* form a “non-legally binding statement of principles”, they bear the marks of a negotiated text by the international community. The concept of SFM has continued to evolve since 1992 through the international forest policy dialogue (IPF/IFF/UNFF) and a large number of initiatives aimed at translating the concept into practice.

Nine eco-regional forestry initiatives or processes² involving 149 countries whose combined forest area equals 97.5 percent of the total forest area in the world, have been established since 1992 with the aim of translating the concept of sustainable forest management into practice. Although evolving independently, these eco-regional processes are conceptually similar in objectives and overall approach and have shared information and experiences resulting in a convergence as regards the main elements constituting SFM.

Recently, an International Conference on the Contribution of Criteria and Indicators for Sustainable Forest Management (CICI 2003) in Guatemala agreed that SFM comprises the following seven common thematic areas: (1) extent of forest resources, (2) biological diversity, (3) forest health and vitality, (4) productive functions of forest resources, (5) protective functions of forest resources, (6) socio-economic functions and (7) legal, policy and institutional framework. The degree of implementation of criteria and indicators at the national level varies considerably. However, the concept of SFM has influenced many initiatives at various levels, has led to the revision of forest policies and legislation and has been mainstreamed by local, national regional and international forestry organisations.

Additionally, a number of recent initiatives in forestry are aimed at translating the specific elements of SFM into practice under different circumstances and for different forest management objectives and levels of scale. These include, among many others: National forest programmes; Integrated mountain development; Integrated, participatory watershed management; Protected Area Management; Model and demonstration forests; Participatory/community forestry; Adaptive collaborative forest management; Model Code of Forest Harvesting Practice/Reduced Impact Logging; Integrated pest management in forestry; Integrated and participatory forest fire management; Landscape restoration; and *In situ* conservation of biological diversity in production forests as well as forest law enforcement.

The results of the aforementioned intergovernmental processes and initiatives held since UNCED demonstrate a move from the focus on whether conservation and sustainable development of the world's forest resources is possible, to a focus on how to implement sustainable forest management practices³.

Amongst the defining characteristics of forests, three are particularly problematic in relation to sustainable forest management (SFM):

- Forests, in particular natural forests have a rather long rotation period which heightens the importance of environmental sensitivity, increases risk and requires high returns or incentives to stimulate investment;
- Forests occupy large areas of land which increases interactions with interest groups on alternative land-uses (including total forest protection) applying political pressure on governments;
- Forests supply important environmental services and subsistence options which makes their use for long-term commercial production contentious.

¹ Full text to be found at <http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>.

² Temperate and boreal forests are covered by the Pan-European and the Montreal processes; arid zone forests by the Dry Zone Africa Process, the Near East Process and the Regional Initiative for Dry Forests in Asia; and tropical moist forests are covered by the Lepaterique Process of Central America; the Tarapoto Proposal, ITTO and the African Timber Organization (ATO). (Some of the regionally based processes cover also other forest types in the region.) Several countries are member of more than one process.

³ FAO-FORM, 2003

Any vision of SFM, particularly natural forests, must accommodate long time-frames, meet the needs of multiple interest groups, at local, national and international levels. The combination of these three factors distinguishes forest trade from other trade domains, such as agriculture. Despite this, forestry as a sector or discipline has evolved primarily through the economic importance of timber and the timber trade. This led originally to a narrowing of vision whereby forestry was mainly about the sustainable economic supply of timber. Such a vision is now widely considered to be out of date, if not harmful and broader notions of sustainable forest management which address environmental and social values as well as economic concerns have emerged.

While definitions of SFM beyond generic C&I vary, there is wide acceptance amongst the various initiatives (eg ITTO's Guidelines and Criteria, the Helsinki process, FSC) that the following elements are involved (IIED 1996):

Sustaining yields of goods and services (timber products, non-timber products, protection of soil and water, maintenance of ecosystem functions, continuing forest health and vitality, contributions to local and global climate

Conserving biological diversity (at the landscape/ecosystem, species and genetic levels)

Ensuring positive social and economic impacts (on indigenous people, local communities, landowners, employees and the local and national economy).

These elements are not fully compatible and some degree of trade-off between them is inevitable. For example, it is clear that all consumptive uses of the forest affect some component or attribute of biodiversity, and that only fully protected areas will conserve all components and attributes of biodiversity (Putz *et al.* 2000).

Within these elements there will also be different interpretations of the relative importance of the various constituent factors depending on the local context. There are no detailed universal prescriptions. Box 1.1 sets out some technical, social and environmental details to be considered in addressing SFM.

Box 1.1 Challenges of sustainable forest management

Production of trees – The technical dimension of SFM

Forest are exhaustible: Forest clearance (for agriculture or others) is often the key reason for forest exhaustion in comparison with forest degradation (often through timber extraction).

Forests have calculable ecological limits: By setting harvesting limits through 'minimum felling diameters' and required recovery periods through a 'felling cycle', it is possible to tailor the harvesting to the ecological capacity of the forest. The two principal options of plantation or natural forest management both benefit from ecological and silvicultural knowledge, although the uniformity of plantations makes the application of that knowledge simpler.

Managing natural forests is technically complex compared to plantations: The quantitative underpinnings which are necessary to match timber harvesting to the natural regenerative capacity in natural forest management are enormous (Ribeiro *et al.* 1999). It is difficult to identify the main commercial timbers some 40 metres below the canopy, *let alone* calculate their growth rates, permissible felling cycles and diameter limits.

Plantations offer simplicity but are not the whole answer. While it is possible to overcome some of the risks associated with monocultures (Evans 1999), plantations will never provide the full range of forest products and services required by society. Moreover, while plantation establishment might 'reduce the pressure' on natural forests, they may also reduce the profitability of those forests, and so hasten their conversion to other land uses.

Long term economic sustainability in natural forests requires positive discrimination between 'good' and 'bad' practice: The widespread under-pricing of forest products from illegal or undesirable trade presents a formidable challenge to SFM. Notwithstanding the evidence of increase profitability of Reduced Impact Logging (Dykstra 2001), there are numerous reasons why unsustainable logging practices persist in the tropics (Putz *et al* 1999).

People first – The social dimension of SFM.

Forests matter to people: Forestry has much to offer for local livelihoods and poverty reduction. For example, a recent review by CIFOR of some 107 studies (Kaimovitz, 2002) shows that forest foods are a regular part of the diet in much of rural Sub-Saharan Africa, whilst in some cases over 50% of farmer's total cash income comes from NWFP like wild honey, charcoal, fuelwood and wild fruits. In many rural African rural areas up to 80% of the population, and in urban areas over 40%, rely on medicinal plants as the main source of health treatment. Between 70 and 90% of the national populations studied rely on fuelwood and charcoal as their main sources of energy. It has long been recognised in India that forest management in defiance of the local needs of the populace leads to conflict and / or resource degradation. (Khare *et al* 2002).

Forests are an important part of cultural and natural heritage: Art, poetry and music have all been used to capture the cultural importance of forested landscapes. In 1972 nations signed up to the Convention for the Protection of World Cultural and Natural Heritage. Subsequent agreements such as UNCED have highlighted the importance of indigenous people's cultures within that heritage.

Forestry can stimulate development given appropriate policies and institutions: Trade in forest products can be an important driver for economic development, provided that adequate governance ensures an equitable distribution of benefits, and the sustainable management of the resource.

Forest work forces are among the most vulnerable: Forestry in general, and logging in particular, continue to be among the three most hazardous occupations in almost all countries (ILO 2001). Examples of contract slavery and forced labour, plus other human rights abuses have been documented (Bales 2000; ILO 2001) but are less frequent than a more usual litany of worker grievances about low pay, poor conditions and in the case of women, sexual harassment (GFC 2000). These problems are perhaps more widespread and more difficult to control in forestry because of remote locations.

The future of trees is on farm? Trees can play an important supporting role in farming systems, not only providing livestock fodder, fruit, medicines and fuel wood, but also acting to enhance the agricultural environment through erosion control and soil amelioration. With the rapid depletion of off-farm resources, many farmers have responded by planting or maintaining trees on farm (Arnold and Dewees 1997). Trees can also provide a measure of seasonal employment (in artisanal production and craft) or longer term capital investments (in timber production) and there has been a growing body of positive experience about outsourcing timber growing in partnership with local farmers (Mayers and Vermeulen 2002).

Nature matters - The environmental dimension of SFM

Forests provide habitats for most of the world's species: The global environment is host to some 7 million species of living organism (excluding bacteria and viruses). About 85% of these are terrestrial. Almost two thirds of all species occur in the tropics, largely in the tropical humid forests (Pimm and Raven 2000).

Forests sequester carbon or reduce climate change: There is growing evidence that increasing atmospheric concentrations of carbon dioxide are linked with rising average global temperature. The present annual increase of carbon dioxide into the atmosphere is 6-10GtC/yr approximately 20% of which (1.6-2.1GtC/yr) has been estimated to arise through deforestation (Bass *et al.* 2000). The use of fossil fuels is by far the largest contributor (75%) to global warming. But even the best case scenario of fossil fuel emission control will not reverse the trend in increasing atmospheric carbon dioxide unless a parallel best case forestry scenario halts deforestation and establishes an afforestation programme.

Defining international trade in forest products and services

Reduced tariff rates are guiding the international trade towards a more optimal trading pattern. The welfare impact is intended to be expressed as a function of lower costs of consumption in consumer countries and as higher return to producer countries of wood and wood-based products. What may emerge is a more efficient, more transparent, more competitive and generally liberalised trading system which potentially fosters sustainable forest management.

Importer countries of roundwood and other primary wood products have in the recent past reduced tariff barriers to trade to economize on their wood raw material. This has improved their local industrial cost competitiveness. What remains is some import tariff escalation for secondary and processed wood-based products which still has an important bearing on trade in forest and wood based products. Producer countries have introduced export bans, restrictions, quotas and taxes to increase rent capture from their forest resource, and to create incentives for domestic further processing. Lately, many producer country policies have gradually de-regulated the trade. Lowering of the producer country barriers causes necessary structural adjustment measures by the industry of the producer country.

However, tariff barriers, both import and export tariff, are relatively low in the trade of forest products. As most of the tariffs are converging to effectively very low levels, the further movement towards optimal trading patterns is mostly conditioned by non-tariff measures (NTM) deriving mainly from environmental and social concerns. The debate on the non-tariff measures in forest products trade, the increasing recognition of environmental services which forests provide both as domestic services as well global public goods and the concept of sustainable forest management increasingly provides evidence that the global trading system needs to take into account the interface between forest management and trade as to overcome some serious limitations in trade, in particular from tropical countries.

NTMs are currently widened in the sense that beyond environmental and social concerns the dimension of legality of production and trade in forest products has gained international support and major activities have been launched in the recent past in this regard. While the international trade policy debate and negotiations focus on universal rules and agreements, the "forest law enforcement initiative (FLEG)" aims at bilateral agreements between producer and consumer countries as to avoid a policy debate on the issue of legality in production and trade within the global trade regime.

With the creation of the World Trade Organisation (WTO), States have agreed to act collectively in view of trade liberalization and in forming a new global trade regime for international trade. Consequently, WTO Members may amend international trade laws, waive their application, or issue binding interpretations on how they should apply based on negotiations and unanimous vote of all member states.

Annexed to the WTO Agreement, and forming an integral part to it, are various WTO multilateral and plurilateral agreements, some of which have important implications on how the WTO's 146 Member States regulate their trade of forestry-related products and services. These include:

- General Agreement on Tariffs and Trade (GATT 1994)
- Agreement on Technical Barriers to Trade (TBT)
- Agreement on the Application of Sanitary/Phytosanitary Measures (SPS)
- Agreement on Implementation of Article VI (Anti-dumping Agreement)
- Agreement on Subsidies and Countervailing Measures (SCM)
- Agreement on Trade-Related Investment Measures (TRIMS)
- General Agreement on Trade in Services (GATS)
- Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)
- Agreement on Government Procurement (Procurement Agreement)

These agreements are of varying importance to the debate on the trade-environment nexus (see Chapter 5 for analysis).

From a legal perspective, the starting point of any discussion on international trade in forest products and services and its impact on forest management is the international recognition of the sovereign right of

states to exploit its own natural resources.⁴ This right is only restricted by the obligation of states not to cause damage to the environment of other states and areas beyond their jurisdiction, and it may also be circumscribed by other international treaty obligations which the states have ratified individually. In the case of the trade in forestry products and services, many states have incurred obligations pursuant to the International Tropical Timber Agreement, 1994 (ITTA), the Convention on Biological Diversity, 1992 (CBD) and the Convention on the International Trade of Endangered Species, 1966 (CITES) as well as under the various WTO agreements.

Other treaties and agreements are currently being screened by WTO bodies for "special trade obligations" (STO) and it remains to be seen what policy implications this process will have. In general, WTO Members have largely agreed upon the meaning of a "multilateral environmental agreement". It is a legally binding instrument between at least three parties attaining a certain degree of universality that has as an objective the protection of the environment, and which is open to all countries concerned from the start of negotiations. The various more detailed positions taken by member countries could determine, for instance, whether the ITTA constitutes an MEA in the WTO legal context since ITTA has long been treated as an MEA despite the fact that it primarily constitute a commodity agreement on tropical timber.

It is important to note that the WTO debate and their results on trade and MEA and consequently on sustainable forest management will have an important bearing on regional and bilateral trade agreements. To date, no major progress has been made with regard to the trade-environment nexus and the policy debates on trade and those on sustainable forest management continue in parallel despite the political will of the majority of states to initiate an integration of these debates and to arrive at a more coherent set of international policies and mutually supportive agreements. This situation was taken into account during the research and the definition of trade in forest products and services addresses this overarching policy issue as provide more information and analysis for making progress.

The primary emphasis of this analysis is on the international trade in timber and timber-based products and its linkages with sustainable forest management. The international trade in non-timber forest products and forest environmental services has been minor in volume and value terms relative to timber. However, the domestic trade in non-wood forest products and the emergence of markets for forest environmental services may have impacts on patterns of trade in forest products and thus indirectly on forest management. For example, some tree-based land use options that are currently unprofitable may become viable should new carbon trading credits for forests become available under the Clean Development Mechanism of the Kyoto Protocol (Bass *et al.* 2000). This will bring new producers and forest areas into the international timber market. Also, non-wood forest products harvested for subsistence and livelihoods of rural communities has an important impact on the policy debate on access to forest resources, the use and the ownership of forest resources as well as land tenure. It is these complementary aspects of NWFP and of markets for environmental services that are of interest for this study since they are causing shifts in the forest resource use and the policy debate on timber and timber-based products trade.

The study adopts a broad definition of forest trade-related policy recognising that the distinction between trade policy and other types of policy is becoming increasingly blurred. It is not sufficient to categorise policies according to whether their primary objective is to promote or restrict trade. A wide range of public policies can now be considered as drivers of or barriers to trade in forest products and services from the measures traditionally associated with trade such as tariffs, import quotas and log export bans to subsidies given to industries in other sectors.

Moreover, stakeholders such as the private sector, investors and NGOs play an increasingly important role at and between all levels in developing and implementing international, regional and national policies that influence the trade and forest management relationship. This broad definition is crucial because as will be discussed later in the analysis, much of the debate about the relationship between trade policy and policies in the forestry sector hinges on what is considered to be legitimate comparative advantage for either of them. Furthermore, the processes of policy making at the various levels touches upon issues of governance which therefore forms an important part of this analysis, including global governance aspects.

⁴ With specific reference to forests, this principle can be found in Article 13 of the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests, 1992, UN Doc. No. A/CONF.151/26(Vol. III) and is included in treaty law, such as in the preamble of the *Convention on Biological Diversity*.

Any policy measure that affects the comparative costs of the forest products sector in a particular country can be considered as a potentially trade-related policy even if its primary objective is environmental or social. It is also important in this context that the main driving force of unsustainable forest management or conversion to other land uses like agriculture and infrastructure is the high returns relative to SFM causing high opportunity costs for SFM. Policies relating to other sectors therefore affect the comparative costs of the forest products sector and hence trade, as well as the incentives for sustainable forest management.

Three types of policies can therefore be considered to affect the trade and forest management relationship:

- Policies aimed at affecting forest management and the production of timber and forest services, and which through their impact on cost structures and resource availability might affect trade in forest products and services, or be affected by trade rules.
- Policies explicitly aimed at affecting trade, particularly in forest products and services, e.g. tariffs, bans etc. or NTB like legality certificates which through their effect on trade, might have an impact on forest management.
- Extra-sectoral policies aimed at other objectives not concerning either forest management or trade in forest products and services but which can have significant effects on trade and forest management.

It is necessary to assess the expected outcome of the current trade patterns with regard to trade flows, volume, and market development and their distribution as well as important issues in market access as to be able to analyse the effects of different types of policies, whether forest-related, trade-related or extra-sectoral, on forest management. The starting point in examining these policies is an understanding of how forests and land use alternatives are valued. It is evident that wood production, wood-based products and their trade faces an increasing challenge in particular through the likely liberalisation of the global market for agricultural commodities as well as the increasing demand for unified wood products deriving mainly from planted forests or forest plantations. The overall decrease in investments into natural forest operations and the environmental conditionalities brought forward in SFM of natural forests has definitely a "chill effect" on trade in hardwood, both from temperate and tropical forests.

Defining international trade in forest products and services includes the debates on the roles of criteria and indicators (C&I) for SFM as well as forest certification and forest products labelling. The former being a primarily national policy instrument (deriving from regional C&I processes) and the latter being market-based instruments have influenced the global trade policy debate enormously. Whatever position governments or civil society constituencies take on these issues, it is undebated that in particular the initiatives on forest certification and forest products labelling have been important fora for standard setting in SFM and have increasingly turned the consumers' attention to products of sustainably harvested sources.

2. Facts and Figures on Forest Resources, Products and Services

2.1 Introduction

In order to examine the debates over the impact of trade on forests and the role of different policy interventions, it is important to have an understanding of the context, in particular the trends in forest cover, forest management and in forest products trade. This is needed to address issues such as the extent and likely causes of forest loss and the extent to which production of forest products is being driven by international trade or by the demands of the domestic market. This chapter starts with an overview of the forest resource base, examining the extent of forest cover in each region in absolute and relative terms, the constraints posed by protected area status and accessibility on exploitation of forest resources and the changes in forest cover over the last ten years. It then considers how these resources are used worldwide, summarising trends in production, consumption and trade of forest products over the last forty years. Finally it looks at forecasts of future trends.

Over the last 30 years, growth in world GDP has been accompanied by more than proportionate expansion of world trade. While the long-term trend in world real GDP growth has shown an annual percentage change of 3-4% between 1970 and 2003, the world trade volume has shown an annual percentage change of more than 6% during the same period (IMF 2003a). The short-term fall in annual growth of real GDP to 2.4% in 2001 reflected a global slowdown exacerbated by the attacks of 11 September, followed by a recovery to 3% during 2002 expected to rise to 4.1% by 2004. During the same period, annual growth in world trade volume fell to 0.1% in 2001 but bounced back to 3.2% in 2002 and is predicted to reach 5.5% by 2004 (IMF 2003b).

In general, the forest sector has shown the same type of trend over the last 40 years, with a gradual increase in global production accompanied by a more dramatic increase in global forest products trade. Between 1961 and 2000 production of wood forest products measured in roundwood equivalents grew by 1.12% per year while the volume traded increased by 3.88% per year.⁵ These general trends hide interesting divergences, which we will return to in subsequent paragraphs relating to different product types (e.g. processing), their geographical and ecological origin, and the sustainability of that origin.

In total, the forest products sector is estimated to contribute about 1% of world GDP (Sizer and Plouvier 1998 and Peck 2001) (approximately 10% of manufacturing's contribution to the world total). It comprises 3% of international merchandise trade, (FAO 1995) involving every country in the world, with an industry annual turnover of US\$ 330 billion (Economist, 31/8/1996).

In comparison with production and trade in say agriculture, forestry appears relatively insignificant. Yet statistics for timber production and trade are widely held in the development literature to underestimate the economic contribution of forests to human well-being. Recent analyses of forests contribution to poverty reduction note their broader significance for local livelihoods (FAO 2001b). As noted in FAO (2003), which states that hundreds of millions of people depend on forests, it is hard to be more specific about the number of people because this depends on how dependence is defined.

The different estimates that exist highlight different aspects of dependence. Thus it is estimated that 60 million highly forest-dependent people live in the rainforests of Latin America, South-east Asia and West Africa. An additional 350 million people are directly dependent on forest resources for subsistence or income, and 1.2 billion people in developing countries use trees on farms to generate food and cash. In South and South-east Asia alone, several hundred million people live on land classified as public forest (White and Martin 2002). 'Loss' of forest resources is asserted to directly affect 90% of the 1.2 billion people who live in extreme poverty (Toyne *et al* 2002).

The growing adhesion to a new multi-dimensional paradigm for human development adds to the appreciation of the multiple ways in which forests can enhance well-being over and above their contribution to GDP and trade (Alkire, 2002). While we restrict our analysis in this chapter to statistical measures of production and trade, we return in the following chapter to the highly emotive issue of how to measure trade related changes within these multiple dimensions of human well-being.

2.2 The Forest Resources

2.2.1 Forests and Current Status of Forest Cover

While there are many debates over what constitutes forest land and the reliability of data on forests and trade (Hyde 1991), the most widely used categories are those of FAO. Forested land is defined by FAO as land with tree crown cover greater than 10% and a mature tree height exceeding 5 metres on over 0.5 hectares (FAO 2001c). Based on this definition, the total area of forests in the world today is estimated at 3.87 billion hectares or almost 30% of the global land area (see Table 2.1). It can also be seen from table 2.1 that forests in tropical countries⁶ account for 48% of the world's forests, covering 39% of that climatic region's land area. Forests in temperate and boreal countries comprise 52% of the world's forests and cover 25% of that climatic region's land area. Approximately 95% of the total forest area is natural forest, the remaining 5% comprising plantations of various sorts (both softwood and hardwood). Plantations

⁵ IIED calculation using data from FAOSTAT 2002

⁶ The division between tropical and non-tropical countries follows that adopted in the FRA 2000 (FAO 2001c). See Annex 1 for a list of tropical and non-tropical countries.

account for 4% of forested areas in tropical countries and 6% of forested areas in temperate and boreal regions. The main areas of plantation are in China, East and South Asia and the former USSR.

Table 2.1 World and regional⁷ data on human and forest resources, 2000

Country	Land area (m ha.)	Forest area (m ha.) ⁱ	Forest area (% land area)	Plantation area (m ha.)	Plantation area (% forest area)	Land area per capita (ha/capita) ⁱⁱ⁼	Rural population (% pop) ⁱ	GNP per capita (US\$) ⁱ
CAC	263.7	78.5	30%	1.3	2%	1.58	34%	2,414
ESA	880.7	203.8	23%	44.0	22%	0.54	70%	888
Europe	475.7	161.9	34%	9.3	6%	0.93	26%	18,739
NENA	1,189.2	27.6	2%	6.5	24%	3.19	37%	2,004
Oceania	1,060.7	308.8	29%	13.5	4%	3.37	54%	2,387
S. America	1,753.5	885.6	51%	10.5	1%	5.15	21%	4,216
SSA	2,377.1	643.6	27%	6.3	1%	3.80	67%	488
F. USSR	2,191.0	901.1	41%	23.3	3%	7.63	31%	1,680
Canada	922.1	244.6	27%	0	0%	29.84	23%	19,267
China	932.7	163.5	18%	45.1	28%	0.73	66%	668
Japan	37.7	24.1	64%	10.7	44%	0.30	21%	43,574
USA	915.9	226.0	25%	16.2	7%	3.32	23%	28,310
Tropical	4,859.2	1,871.4	39%	67.8	4%	1.7	63%	993
Non-tropical	8,140.9	1,997.6	25%	118.9	6%	2.7	44%	8,808
Total	13,000.0	3,869.0	30%	186.7	5%	2.18	53%	5,021

ⁱ Forest area is the sum of natural forests and plantations

Source: Calculated from FAOSTAT on-line database (2002) and FAO (2001c).

There are stark contrasts in the socio-economic characteristics of different regions. As shown in Table 1, tropical countries as a group show a far higher rural population than temperate and boreal countries (63% compared with 44%) and a higher population density. This suggests a consequent higher dependence on forests for subsistence and income and greater pressures for forest conversion to other land uses. But there is considerable variation. In East and South Asia which is mostly tropical and where 70% of the population is rural, there is just over half a hectare per person. In South America though, the rural share of population is much lower at 21% and population density is lower, there being over 5 hectares of land per head of population. There is even more variation in population density within temperate regions with Canada having just under 30 hectares per capita, Europe having less than one hectare per capita and Japan only 0.3 hectares per capita. Yet the latter two regions, have a higher forest area as a proportion of total

⁷For the purposes of this analysis the world is divided into two climate zones (tropical and temperate / boreal) and 12 regions: Central America and the Caribbean (CAC); East and South Asia (ESA); Europe; Former USSR; Near East and North Africa (NENA); Oceania; Sub-Saharan Africa (SSA); South America; China; Canada; Japan; and the USA.

land area than Canada. Tropical countries have on average much lower economic wealth per capita (11.3% that of their temperate and boreal contemporaries) which compounds forest dependence.

While the figures in Table 2.1 show some clear differences between tropical and non-tropical countries as a whole, they also show considerable variation at a more disaggregated level. This highlights the complex and locally-specific relationships between forest area, demographic patterns and economic wealth. The contextual differences between different trading blocks complicate general value statements regarding the impact of forest trade. In addition to forested land, there are substantial areas designated as 'other wooded land', which are not captured in the statistics in Table 2.1. This is either land with scattered trees of 5 metres or more (5–10% of crown cover) or with smaller trees (less than 5 metres) with more extensive crown cover (over 10%). These areas of other wooded land equate to about 10% of total land area (FAO 2001c). Many of these areas (and particularly trees on farm) also provide substantial quantities of forest products and services.

Inevitably, the transition between different categories of land on which trees occur is affected by both natural and man-made processes of renewal or degradation (e.g. natural regeneration and planting, climate change and climatic events, pollution, natural pests and diseases, fire and management/mismanagement). Forest condition is arguably as important as forest cover, although much harder to measure. Moreover there are complex interactions between the factors which affect forest condition (e.g. the way logging increases the predisposition of forests to fire - Nepstad *et al.* 1999a, 1999b). As a result, many of the often imperceptible changes of forest condition may also in time have serious implications for forest cover.

2.2.2 Trends in Forest Cover Change and Sustainable Forest Management

The dramatic market-led shift in the origin of forest production towards plantation and semi-natural forest types (as described above) has two contrasting implications for the sustainability of forest management. On the one hand, it is much easier to manage plantation and semi-natural forests sustainably than comparable complex natural forests (and especially diverse tropical forests) - so there is an increasing likelihood that the timber from production forests will come from a sustainable origin.

On the other hand, the much greater intensity and efficiency of forest production in relatively tiny plantation and semi-natural forest areas may leave extensive remaining tracts of natural forest below the minimum threshold for economically viable production (Macqueen 2001). In the absence of other mechanisms to attribute value to those natural forests, forest clearance for alternative land uses and/or the lucrative, unsustainable and possibly illegal creaming of timber resources become rational (although perhaps undesirable) economic alternatives.

Given the varying definitions of SFM within natural forests, semi-natural forests and plantations and the difficulties involved in assessment, there is little systematic information available on the quality of forest management worldwide. Most commentators agree that SFM, though on the increase, is the exception rather than the rule in natural forests (Gregory *et al.* 2000). Assessing sustainability in plantations and semi-natural forests (e.g. simple temperate systems) is much easier.

The clearest indication of SFM is given by the statistics of the certification systems but there are well-managed forest areas that have not applied for certification are not captured by this data. As of September 2003, certified forests account for an estimated 160 million hectares worldwide. This equates to just over 4% of total forest area.

Moving from the management level to the landscape level, the only proxy indicator for sustainability in the forest sector is given by the changing patterns of forest cover worldwide. Between 1980-1990 according to FAO's Forest Resource Assessment 1990, the net loss in forest cover came to 9.9 m ha per year (total losses subtracting natural and planted increases - FAO 2001c). In 1990, net loss of tree cover was occurring in 75 countries with estimates suggesting that 15.4m ha of mature tropical forest was being lost annually (EIA 2002).

Over the subsequent decade to 2000, it was estimated that 14.6m ha of forest were lost each year, but that 5.2m ha were newly established, leaving a net decrease of 9.4m ha (see Table 2.7). This equates to a global rate of forest loss of 0.24%. Table 2.7 also shows that while non-tropical areas saw a slight increase in forest area resulting from natural expansion and afforestation, tropical areas experienced a

significant reduction mainly as a result of conversion to other land uses. Despite changes in assessment definitions it is safe to say that the net loss of forest has decreased slightly over the last 20 years - although the scale and location of continuing losses continues to be an issue. In total, there was a net loss of tree cover in 89 countries and a net increase in 67 countries (FAO 2001c). Gains were reported in Europe, NENA, Former USSR, Canada, Japan, China and the USA⁸, although many of these countries or regions had already depleted much of their forest resource in previous centuries.

Table 2.2 Annual change in forest area, 1990-2000 (m ha per year)

		Tropical areas	Non-tropical areas	World
Natural Forest	Deforestation	-14.2	-0.4	-14.6
	Conversion to forest plantation	-1.0	-0.5	-1.5
	Total loss	-15.2	-0.9	-16.1
	Natural	+1.0	+2.6	+3.6
	Net change	-14.2	+1.7	-12.5
Plantation	Conversion from natural forest	+1.0	+0.5	+1.5
	Afforestation	+0.9	+0.7	+1.6
	Net change	+1.9	+1.2	+3.1
Total forest	Net change	-12.3	+2.9	-9.4

Source: FAO (2001c)

2.2.3 The Changing Origin of Forest Production: Natural and Planted Forests

Historically, the vast majority of timber production has come from natural forests in both temperate and boreal regions and tropical and subtropical regions. Timber has been sourced both from sustainably (and unsustainably) managed forests and from land clearance. The clearance of forest land has its origins in land use competition and has resulted in the residual forest cover shown in Table 2.1. Land use competition is most pronounced in areas made accessible by transport infrastructure - some of which has been developed explicitly to enable forest harvesting, some of which has been developed for agricultural or other forms of land use settlement. Using evidence from both satellite and sociological data it has been shown that "increased road density in a country leads to more deforestation in that country and in neighbouring countries" (Pfaff 1996) - a fact explaining recent reactions towards new infrastructure development programmes in forested areas (Nepstad *et al.* 2000).

The development of transport infrastructure has not occurred uniformly across all forested regions, it being a function of many factors such as policy direction, population density and the stage of economic development. As a result, timber extraction has historically been focused on more populous and developed regions such as temperate Europe and more recently South East Asia and less so in areas such as the Brazilian Amazon and Central Africa. Large areas of boreal forest also have limited accessibility because of their distance from transport infrastructure. This can be seen from Table 2.2, which shows estimates of the size and significance of altitude, legal and economic constraints over forested land area available for wood supply. Worldwide as much as 43% of the forest area is beyond 10km from major transport infrastructure and is therefore not likely to be economically accessible. In South America this proportion increases to 60%. In Europe, this proportion is also relatively high at 47% because of the large areas of boreal forest. It can also be observed that in most regions it is the economic restrictions implied by remoteness that have the greatest effect on availability rather than the protected area status or altitude.

Estimates of protected forest area vary because of differences in definition of forest area and in the definition of protected. An early IUCN estimates classes 7.5% as protected (Iremonger *et al* 1997. The FRA 2000, based on a global protected area map developed by UNEP-WCMC, estimates that 12.4% of forests worldwide are in protected areas as defined by the IUCN categories for protected areas (FAO 2001c)⁹. A later estimate by WCMC gives a slightly lower estimate of 10.4% probably due to the use of a

⁸ IIED calculation based on data in FAOSTAT on-line database (2002)

⁹ These figures differ slightly from those in Table 2.2 even though they are both derived from the FRA 2000 (FAO 2001c). FRA 2000 gives two estimates of protected forest area: 428 ha in Table 9.2 (p76) and 479 ha in Table 7.2 (p63). It is possible that the area inaccessible for altitude reasons also includes some protected areas, explaining why the figure for protected area in the table 9.2 of FRA differs from that of Table 7.2

different definition of forest (WCMC 2003)¹⁰. Table 2.2 shows that there is considerable regional variation in the extent of protected area forests, with relatively high proportions in North and Central America, and in South America and a rather low proportion in Europe. These statistics however, say little about the extent of protection in practice.

Political and economic concern over the increasing inaccessibility of remaining natural forest resources, and the cost of sustainable management in them, coupled with the continuing expansion of the global market for timber, have enhanced the economic viability of plantations and also semi-natural forests. Semi-natural forests are common within but by no means exclusive to temperate and boreal zones and are typically monoculture stands, but occasionally contain more than one species, managed like plantations, but whose regeneration occurs naturally rather than through plantation)). The area of plantations has consequently increased rapidly since the 1980s, and now corresponds to 5% of total forest area and 8.5% of economically accessible forest (as defined in Table 2.3 below).

Table 2.3 Altitude, legal and accessibility constraints on wood supply

Region	Restrictions on forest availability million ha	Percentage of forest area %
Africa		
Inaccessible owing to altitude	n.a.	n.a.
In protected areas	69	11
Beyond 10 km from major transport infrastructure	195	30
Asia		
Inaccessible owing to altitude	26	5
In protected areas	59	11
Beyond 10 km from major transport infrastructure	170	31
Oceania		
Inaccessible owing to altitude	n.a.	n.a.
In protected areas	21	11
Beyond 10 km from major transport infrastructure	78	39
Europe		
Inaccessible owing to altitude	56	5
In protected areas	37	4
Beyond 10 km from major transport infrastructure	491	47
North and Central America		
Inaccessible owing to altitude	24	4
In protected areas	101	18
Beyond 10 km from major transport infrastructure	229	42
South America		
Inaccessible owing to altitude	2	0.2
In protected areas	141	16
Beyond 10 km from major transport infrastructure	528	60
World		
Inaccessible owing to altitude	109	3
In protected areas	428	11
Beyond 10 km from major transport infrastructure	1,672	43

¹⁰The baseline definition of forest used by WCMC is for canopy cover exceeding 30% (except for the category of “sparse forest and parklands” when 10% is the baseline).

Source: Calculated from Table 9.2 in FAO (2001c). Note that these areas may overlap and so if added together will overstate the constraints on availability.

Table 2.4 shows the regional breakdown of plantation area and planting rates. It can be seen that Asia is currently the dominant region for plantations accounting for 62% of the world's total plantation area. As the extent of annual planting in Asia also is much higher than anywhere else, corresponding to 78% of the global total, the concentration of plantations in this region is likely to continue.

Table 2.4 Plantation areas and plantation rates by region

Region	Total Area 000 ha	Share of total %	Annual planting rate 000 ha/yr
Africa	8,036	4	194
Asia	115,847	62	3,500
Europe	32,015	17	5
North and Central America	17,533	9	234
Oceania	3,201	2	50
South America	10,455	6	509
World Total	187,086	100	4,493

Source: FAO (2001c)

FAO (1998) estimates that current plantation area in the southern hemisphere has a potential annual growth of 1.1 bn m³ (approximately 70% of current industrial timber production). As such plantation areas mature, it is widely anticipated that there will be a continuing dramatic shift in the origin of timber supply towards plantation areas (Evans 1999). Sedjo and Botkin (1997) estimate that current demand for industrial roundwood could be met by plantations on as little as 1.5 m km² of land, approx 4% of current global forest area. Table 2.4 presents forecasts of the continued shift of supply to plantations.

These estimates predict that by 2050 50% of the world's industrial roundwood supply will be sourced from fast-growing industrial plantations and that only 5% will be derived from unmanaged old growth forests. Most of these fast-growing plantations will be in the tropics and sub-tropics where climatic conditions are particularly favourable for the species involved.

If these predictions prove correct, concerns over the impact of forest harvesting and trade will shift to how plantations are run and how natural forests that are not used for timber production can be protected effectively.

Table 2.5 Estimated current and forecast industrial roundwood supply by forest management situation (% global harvest)

Forest type	2000	2050
Old-growth	22	5
Second-growth (minimal management)	14	10
Indigenous second-growth (managed)	30	10
Industrial plantations indigenous	24	25
Industrial plantations, fast-growing	10	50

Source: Sedjo (2001)

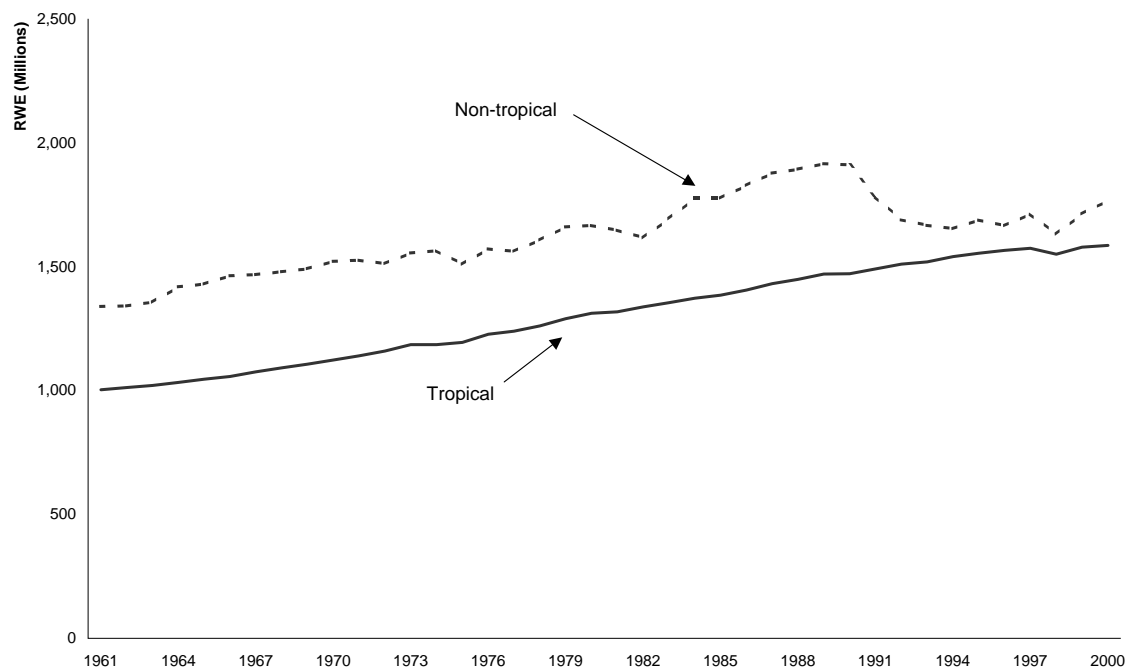
2.3 Wood and Wood-based Products: Production, Consumption and Trade

While there is increasing interest in the range of non-timber forest products and environmental services from forests, timber remains the primary product which is produced and traded from forests. We examine the trends in production over the last 40 years for different types of wood product, highlighting some recent developments such as the emergence of new players on the world market for forest products.

2.3.1 Production

With regard to primary wood products, the total volume of roundwood felled globally¹¹ declined in the 1990s but has started to increase again. As can be seen in Figure 2.1, most of the fluctuation in production has been in non-tropical countries. In tropical countries there has been a steady but small increase in production since the 1960s.

Figure 2.1 Global volume of roundwood felled (m³ RWE), 1961-2000



Source: IIED calculations based on FAOSTAT on-line database (2002)

Table 2.6 shows that total harvest currently exceeds 3 billion cubic metres annually and that production has grown at just under 1% per annum since 1961.

¹¹ Estimation of production is based on analysis of data from particular stages in the production process and conversion into roundwood equivalent (RWE). RWE is estimated by converting wood product into the equivalent volume of logs needed to produce that product using a standard conversion ratio. Roundwood, 1.00; Sawnwood, 0.50; Panels, 0.44; Paper 0.33; and Pulp 0.27. Conversion rates calculated from: Anon (2000); Anon (1948); Blandon (1999); Brown (1997); Michie and Wardle (1998); ITTO (2000); UNECE/ FAO (1999).

Table 2.6 Total roundwood production, 1961–2000

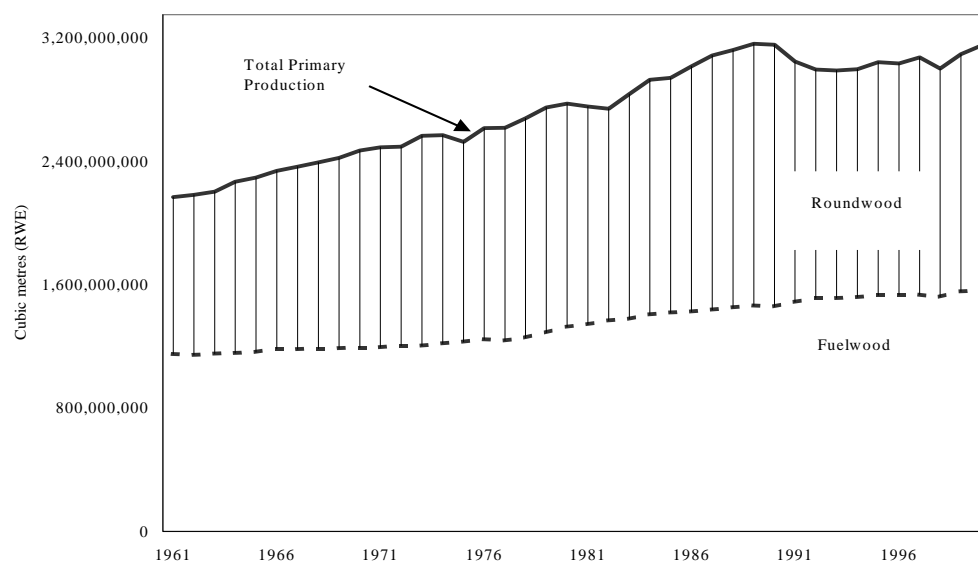
REGION	1961	1971	1981	1991	2000	Annual Change
CAC	57,387,243	67,248,008	76,396,820	86,495,353	94,691,214	1.26%
ESA	305,319,306	384,051,695	464,518,912	538,670,419	535,421,764	1.41%
Europe	308,173,000	335,752,016	331,400,016	316,377,000	378,410,667	0.51%
NENA	35,814,883	62,018,917	52,890,032	48,469,537	47,725,007	0.72%
Oceania	292,561,716	270,719,621	248,436,147	226,267,831	197,430,551	-0.98%
S. America	145,429,194	167,077,098	227,695,451	277,518,355	337,998,999	2.13%
SSA	256,641,880	320,874,758	388,174,943	473,433,184	568,382,396	2.01%
Former USSR	351,000,000	384,700,000	358,200,000	356,400,000	198,938,610	-1.41%
Canada	93,569,008	119,819,000	144,736,000	160,168,000	187,443,903	1.75%
China	141,653,000	172,834,360	233,576,712	282,440,760	287,471,832	1.79%
Japan	65,048,999	46,978,000	31,747,999	28,106,000	18,120,621	-3.14%
USA	289,770,016	334,318,016	407,094,008	478,600,000	500,433,996	1.38%
Tropical	1,002,749,342	1,138,601,366	1,315,760,786	1,489,628,464	1,584,553,074	1.15%
Non-tropical	1,339,618,903	1,527,790,123	1,649,106,254	1,783,317,975	1,767,916,486	0.70%
Total	2,342,368,245	2,666,391,489	2,964,867,040	3,272,946,439	3,352,469,560	0.90%

Source: IIED calculations based on FAOSTAT on-line database (2002).

Table 2.6. also shows that faster growth is recorded in tropical regions (particularly East and South Asia, Sub-Saharan Africa and South America) but with the higher total volume of production from non-tropical regions. In three regions, Oceania, former USSR and Japan, production has been declining.

Roundwood can be divided into two primary (extractive) categories of wood product: industrial roundwood and fuelwood (for the latter see Section 2.3 for details). Figure 2.2 depicts the relative volumetric significance of the two categories over time. The figure shows the fact that fuelwood is roughly as significant a production category as industrial roundwood – and that this significance has not diminished despite global development efforts over the past four decades which might have been expected to reduce dependence on fuelwood. For the purposes of this analysis, the important point is that forest management is as much affected by the production of fuelwood as it is by the production of industrial roundwood.

Figure 2.2 Total primary wood production, 1961–2000:

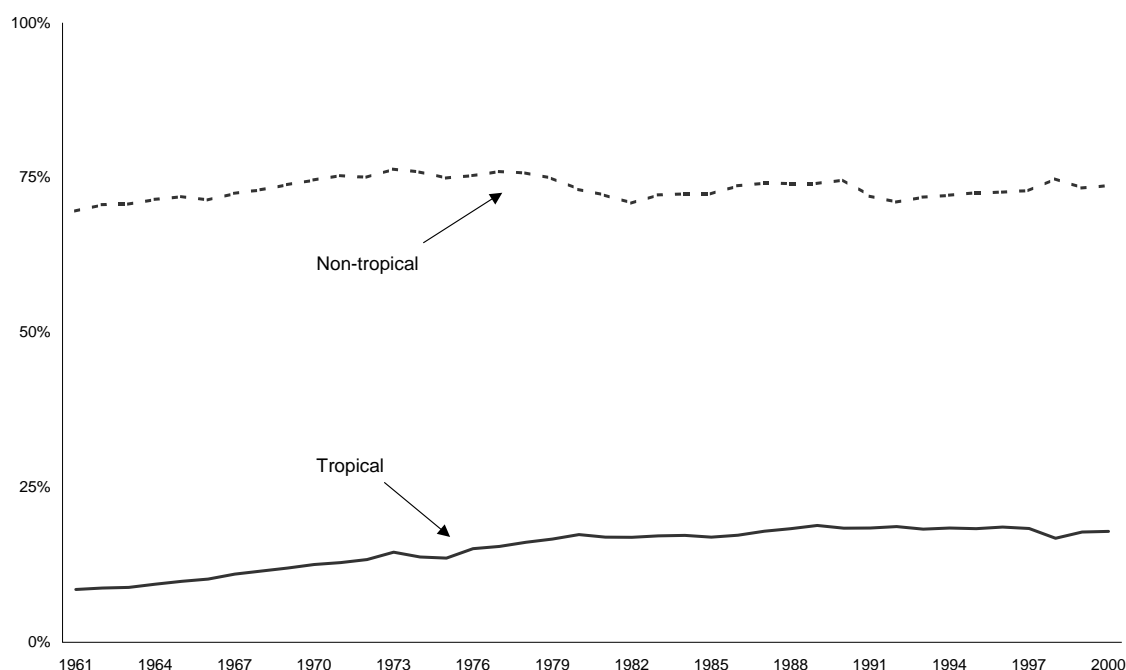


Source: IIED calculations based on FAOSTAT on-line database (2002).

The category of industrial roundwood includes logs, wood residues, and chips and particles, the basic inputs for all other industrial wood product categories. As can be seen from Figure 2.2, the proportion of industrial roundwood in total roundwood has remained fairly constant at around 50% apart from some variation in the late 1980s.

However, there are marked differences between tropical and non-tropical countries (see Figure 2.3) and among regions. Over 1961–2000, the industrial roundwood proportion has remained above 70% for non-tropical countries and has doubled from 9% to 18% for tropical countries.¹²

Figure 2.3 Trends in production of industrial roundwood as a percentage of total roundwood production, 1961-2000



Source: IIED calculation based on FAOSTAT on-line database (2002).

The largest producers of industrial roundwood are USA, Europe, Canada, and South America. Production has been relatively stable since 1980 apart from a rising trend during the late 1980s, which ceased with the break-up of the USSR. Table 2.7 explores the regional dynamics of production. It can be seen that annual total production of industrial roundwood from all sources has expanded by 1.12% on average since 1961, with all regions increasing their production except the former USSR (declining since 1971) and Japan (declining throughout). Tropical countries exhibit greater annual increase in production than non-tropical countries, growing at 3.0% per year in comparison to less than 1%. As a result their share of total output has risen from 8% in 1961 to 18% in 2000. This is due both to increases in hardwood production from natural forests and due to the maturation of tropical plantations in regions such as South America and South East Asia.

¹² IIED calculations based on FAOSTAT on-line database 2000.

Table 2.7 World and regional distribution of industrial roundwood production, 1961–2000 (m cum)

Region	1961	1971	1981	1991	2000	Average annual change, 1961–2000
Total	1,017	1,296	1,412	1,558	1,587	1.12%
CAC	6	9	11	11	13	1.93%
ESA	26	49	72	87	68	2.38%
Europe	23	273	280	267	325	0.94%
NENA	8	12	13	9	13	1.43%
Oceania	30	49	63	81	83	2.61%
South America	28	41	84	114	153	4.35%
SSA	24	40	50	54	67	2.59%
Former USSR	253	298	277	275	139	-1.48%
Canada	87	116	139	153	183	1.88%
China	35	43	76	90	96	2.53%
Japan	49	45	31	28	18	-2.49%
USA	248	320	317	388	428	1.37%
Tropical	85	146	222	274	283	3.04%
Non-tropical	932	1,151	1,190	1,284	1,303	0.84%

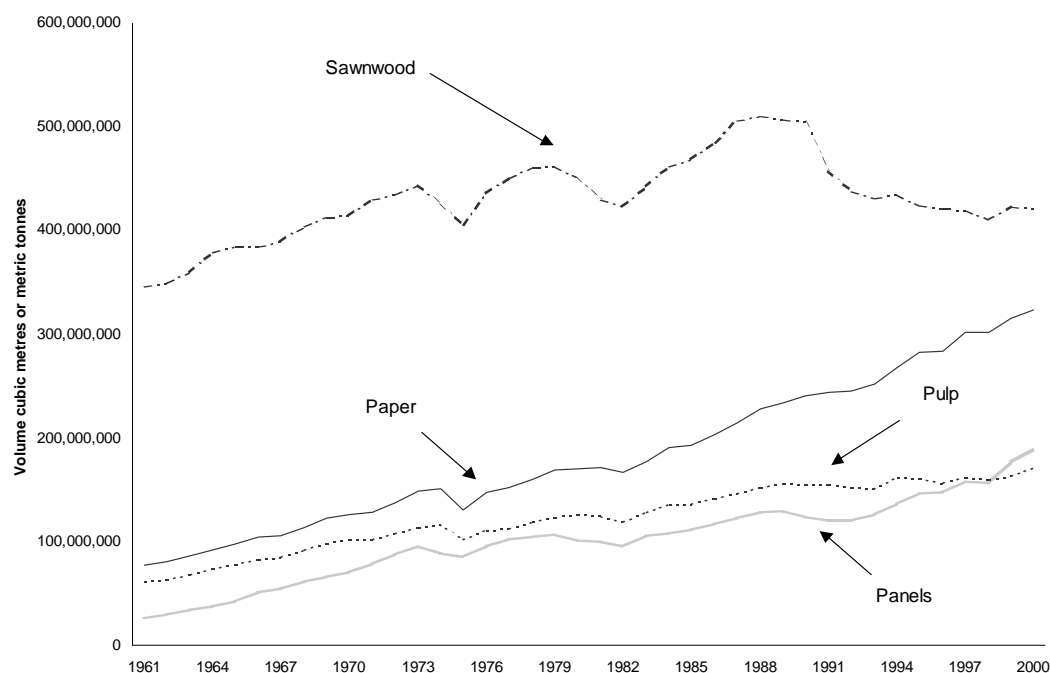
Source: FAOSTAT on-line database (2002)

Processed Wood Product Categories

World production of processed wood products has been increasing since the 1960s (see Figure 2.4 and Table 2.8) for each of the four main product categories: sawnwood, pulp, paper and panels, with paper and panels showing the highest rates of growth. Sawnwood production has been more cyclical such that current production levels are only slightly higher than in the beginning of the 1980s. These trends hold true for each region as shown in Table 2.10, except in the case of sawnwood production which has been declining in China, Japan and Former USSR but has grown slightly faster in Canada than paper production. Tropical countries have experienced considerably higher growth rates for all four product categories than non-tropical countries. This reflects particularly high growth rates in East and South Asia, and South America.¹³

¹³ Calculated from data in FAOSTAT on-line database 2002

Figure 2.4 Trends in world production of processed wood product categories, 1961–2000



Source: Calculated from FAOSTAT on-line database (2002).

Table 2.8 Trends in annual production by product category, 1961–2000 (% per annum)

Region	Pulp	Paper	Sawnwood	Panels
CAC	2.71%	5.59%	2.01%	2.79%
ESA	9.97%	8.52%	2.93%	10.81%
Europe	2.03%	3.51%	0.78%	5.01%
NENA	5.36%	6.07%	4.08%	7.81%
Oceania	5.87%	6.85%	0.79%	8.30%
South America	8.05%	5.25%	2.73%	8.26%
SSA	5.58%	6.17%	2.47%	4.75%
Former USSR	1.44%	1.38%	-3.23%	3.03%
Canada	2.34%	2.43%	3.21%	5.85%
China	4.20%	6.83%	-1.07%	11.38%
Japan	2.60%	4.54%	-1.21%	2.99%
USA	2.39%	2.62%	1.15%	3.65%
Total	2.59%	3.63%	0.49%	5.06%

Source: Calculated from FAOSTAT online database (2000)

Secondary Processed Wood Products (SPWPs)

In addition to the expansion of processed products, there has been a rapid expansion in the production of Secondary Processed Wood Products (SPWPs). The Standard International Trade Classification of these lists SPWPs in several categories which include: Wooden furniture and parts; builder's woodwork, other SPWPs (including packaging, cooper's products, domestic products etc.) mouldings. ITTO also now include NTFP-based furniture in their analysis (ITTO 2002). The production of SPWPs is spread across the globe and is increasingly offering tropical countries and Eastern European countries entry points into international trade. Furniture is by far the most important category for trade and China, Indonesia and Malaysia vie with Italy, Canada, Poland and the USA for the export markets. While production is dominated in tropical regions by South East Asia, capacity is also expanding rapidly in other areas of the tropical and/or developing world such as Brazil (primarily in furniture) and Cote d'Ivoire and Ghana (primarily in mouldings).

The most notable feature of SPWP production has been the spectacular rise in Chinese production capacity. From a total output value of US\$ 157 million in 1978, Chinese furniture production expanded to US\$16.9 billion in 2001 involving 50,000 enterprises and nearly 5 million employees (ITTO 2002). The annual rate of production increase approximated to 24% in value terms and was driven both by internal consumption and by expanding exports (which grew at 17% per annum in value terms over the same period) (ITTO 2002).

2.3.2 Changing Consumption Patterns

Increasing production, as can be expected, has been accompanied by increasing consumption at a global and regional level. With some exceptions, the trend in consumption over 1961–2000 is upwards for all regions and wood product categories. The main exceptions are for roundwood and sawnwood. Table 2.9 shows the average annual growth rate in apparent consumption over the last 40 years. It can be observed that both Japan and the former USSR have experienced declines in consumption of these two commodities. In the case of the former USSR, this reflects this region's political transformation during the 1990s. Before then consumption had been fairly stable. In the case of Japan, reduced consumption in the 1990s of roundwood and sawnwood reflected the recession that plagued the Japanese economy in this period. China also experienced a reduction in sawnwood consumption in the 1990s, probably reflecting a switch into other wood products such as panels. Consumption of panels in China grew at 10.8% per year over the period 1961 and 2000 and increased almost fourfold between 1991 and 2000.¹⁴

Table 2.9 Average annual change in volume of apparent consumption 1961-2000

Region	Industrial Roundwood	Sawnwood	Panels	Pulp	Paper
Total	1.12%	0.50%	5.11%	2.59%	3.64%
CAC	2.06%	2.68%	5.91%	3.18%	6.18%
ESA	1.21%	1.44%	5.20%	5.94%	5.25%
Europe	1.10%	0.71%	5.04%	2.39%	3.35%
NENA	1.68%	3.83%	8.41%	6.22%	6.39%
Oceania	2.74%	0.03%	6.63%	4.87%	4.98%
South America	4.32%	2.43%	7.79%	5.41%	4.59%
SSA	2.91%	2.03%	5.57%	5.07%	4.26%
Former USSR	-2.29%	-4.44%	2.48%	0.84%	0.71%
Canada	1.98%	2.44%	3.37%	1.58%	3.26%
China	2.23%	-0.58%	10.80%	4.81%	6.47%
Japan	-1.35%	-0.10%	5.47%	3.10%	4.66%
USA	1.30%	1.63%	4.10%	2.29%	2.50%

Source: IIED calculation based on FAOSTAT on-line database (2002)

¹⁴ IIED calculation based on FAOSTAT online database 2002

Table 2.9 also shows that at a global level, the highest rates of growth over the period are for panels and paper and the lowest rate is for sawnwood at only 0.5% per year. Consumption has been growing fastest in Near East and North Africa, South America and China and relatively less rapidly in the former USSR, Canada and the US. Of interest here is the difference between growth rates in consumption and production. A comparison of Table 2.9 and Tables 2.8 and 2.7 in the previous section reveals that there are some divergences at the regional level. Declines in consumption of roundwood and sawnwood in Japan and the former USSR were accompanied by less marked reductions in production. While consumption of panels increased in China, production of panels grew even faster at 11.4% per year, reflecting a growing export industry. In the US, consumption of panels and sawnwood grew more rapidly than production over the period, implying increasing imports, while for pulp, paper and industrial roundwood, production growth rates were higher than consumption growth rates implying increasing export.

In terms of absolute consumption levels, it can be seen from Table 2.10 that the US and Europe are the major consumers for all four processed wood product categories, together accounting for over 55% of world consumption in all four cases. China is in third place for both paper and panels, reflecting recent economic growth. Other major consuming regions according to Table 2.12 are Japan with over 6% of world consumption for all four product categories, East and South Asia, particularly for paper and sawnwood, and South America which has relatively high consumption of sawnwood and panels.

Table 2.10 World and regional consumption of wood product categories by volume and as a proportion of total world consumption, 2000

Region	Pulp		Paper		Sawnwood		Panels	
	(mt)	(%)	(mt)	(%)	(m ³)	(%)	(m ³)	(%)
Total	171.2	100.0	324.0	100.0	421.9	100.0	193.9	100.0
CAC	1.0	0.6	8.2	2.5	7.1	1.7	1.3	0.6
ESA	5.8	3.4	18.3	5.7	22.2	5.3	7.8	4.0
Europe	48.2	28.2	85.5	26.4	103.4	24.5	59.3	30.6
NENA	1.1	0.7	7.1	2.2	11.7	2.8	5.7	2.9
Oceania	5.6	3.3	10.1	3.1	8.6	2.0	5.5	2.8
South America	6.8	4.0	11.5	3.5	25.5	6.0	9.1	4.7
SSA	1.7	1.0	2.7	0.8	6.5	1.5	1.3	0.7
Former USSR	4.6	2.7	4.6	1.4	16.9	4.0	5.1	2.6
Canada	15.0	8.8	8.1	2.5	21.2	5.0	5.2	2.7
China	7.7	4.5	42.4	13.1	12.1	2.9	24.0	12.4
Japan	14.3	8.4	31.8	9.8	27.0	6.4	11.9	6.1
USA	59.2	34.6	93.7	28.9	159.6	37.8	57.6	29.7

Source: IIED calculation based on FAOSTAT on-line database (2002)

Statistics for the consumption of most secondary processed wood products are frequently not collected except in a few OECD countries and selected ITTO members.¹⁵ Consumption volumes are therefore notoriously difficult to assess. But there are indications that the volume of final products consumption has reached very large proportions, with furniture consumption doubling over 1991–2001. (Peck 2001). In 1998 the furniture industry was in the Top 20 product groupings in trade,¹⁶ with an annual value exceeding US\$ 50 billion. Indeed, it is asserted that between 1961–94, only computers registered faster growth of imports into high-income countries than furniture.¹⁷

¹⁵ For a discussion of the inherent problems with SPWP data, see ECE/FAO (2001).

¹⁶ At the 3-digit SITC level. Reported in Kaplinsky and Readman (2000).

¹⁷ Based on an internal paper prepared for the IKEA Corporation, cited in Maskell (1998) in turn cited by Kaplinsky and Readman (2000).

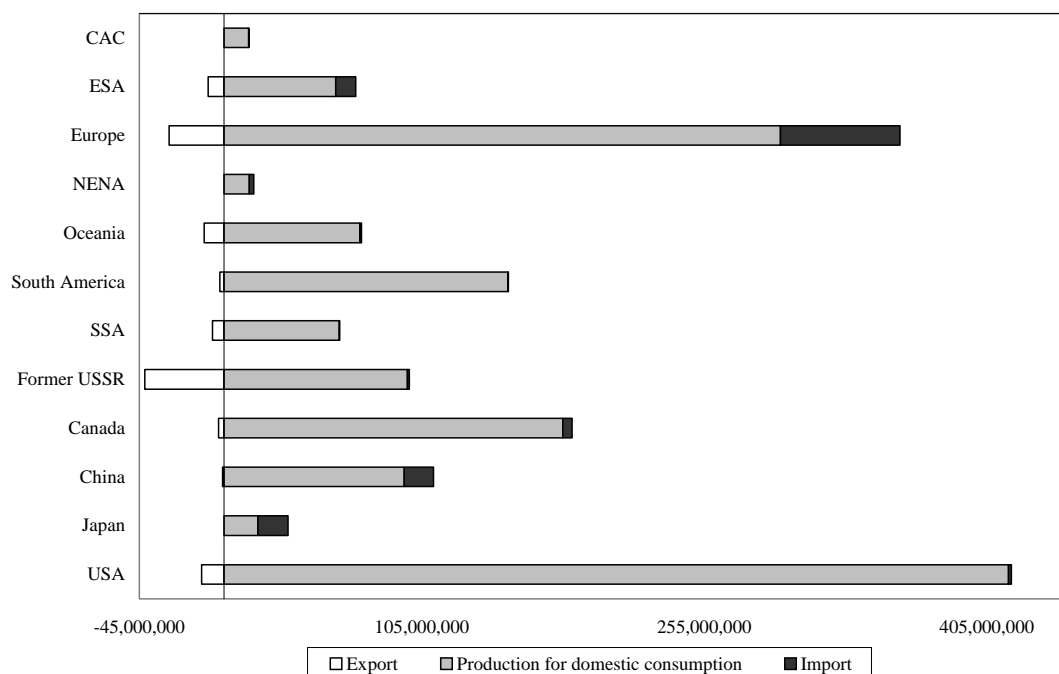
2.3.3 Trade Developments and Value of Trade

As observed in the previous section, the increase in consumption of wood products in all regions has not been exactly matched by increases in production in the same region. This implies increasing trade. Globally, there is a trend to export a greater proportion of timber harvested, whether as industrial roundwood or as processed products. The trend is strongest in non-tropical countries indicating the maturing of plantations during the 1990s coupled with increased demand from tropical countries as consumption in those countries continues to rise.

Wood and Wood-based products

Before launching into a consideration of the rapidly expanding international trade in industrial roundwood it is important to put such trade into perspective. Despite global expansions in international trade, the vast majority of all wood-based production is destined for consumption in the domestic markets of producing countries. Figure 2.5 highlights the fact that in all regions, the quantities of exports or imports from or to countries in those regions are a tiny percentage of wood that is produced and consumed internally in each country.

Figure 2.5 Regional balances for industrial roundwood, 2000 (cum)



Source: Calculated from the FAOSTAT on-line database (2002).

The limited extent of international versus domestic trade (true also for other categories of forest product) puts into context extent to which international trade might be expected to influence sustainable forest management in any region in comparison with domestic trade. Nevertheless, the rapid expansion of international trade is not totally insignificant, noting the recent significant industrial roundwood exports from the former USSR and the recent expanding imports to China. The expansion of international trade is changing the dynamics of competition on such elements as price, product type and quality, social and environmental production standards - shifting production locations and practices in the process.

The trends in industrial roundwood emphasise the rapidly expanding dimension of international trade. As can be observed from Table 2.11, export volume has almost trebled since 1961, with global exports of industrial roundwood exceeding 114 million m³ in 2000. However, exports have grown faster in non-tropical countries and in contrast in tropical countries exports have declined since 1971, most probably reflecting the imposition of log export bans.

Table 2.11 World and regional export volumes of industrial roundwood, 1961–2000 (cum)

REGION	1961	1971	1981	1991	2000	Annual Change
CAC	331,600	388,600	27,800	21,916	56,029	-4.35%
ESA	3,100,800	11,518,000	16,343,700	21,556,569	8,396,486	2.52%
Europe	12,861,800	13,178,300	18,977,750	23,157,048	29,190,263	2.07%
NENA	16,100	36,300	38,000	3,190	4,485	-3.14%
Oceania	5,017,500	21,831,400	10,277,200	5,495,491	10,583,422	1.88%
S. America	391,000	315,500	463,100	2,341,384	2,198,872	4.41%
SSA	4,756,000	6,762,500	4,925,400	4,057,714	6,101,652	0.62%
Former USSR	5,481,500	14,301,900	13,335,900	10,623,643	42,112,075	5.23%
Canada	3,501,500	2,872,500	1,972,600	1,355,948	2,947,000	-0.43%
China	42,600	123,000	59,100	773,613	781,184	7.54%
Japan	23,800	22,600	31,800	34,065	3,800	-4.48%
USA	2,636,100	10,718,700	12,593,800	20,700,384	11,968,000	3.85%
Tropical	13,276,000	38,802,200	30,790,500	27,343,016	18,847,921	0.88%
Non-tropical	24,884,300	43,267,100	48,255,650	62,777,949	95,495,347	3.42%
Total	38,160,300	82,069,300	79,046,150	90,120,965	114,343,268	2.78%

Source: Calculated from the FAOSTAT on-line database (2002) and FAO (2001c).

Exports of the basic commodities logs, chips and residues appear to be spread between developed and developing countries. A number of regions are both major exporters and major importers. The three main exporting regions are the former USSR, followed by Europe, and then USA. The case of the former USSR is of particular note. Following the collapse of the centrally controlled market, low production costs, a weak currency and abundant natural resources have enabled Russia to increase its roundwood exports by as much as 14% in 2002 (Ekstrom 2003). Even with greatly expanded exports, Russian production is still well below its annual allowable cut and with rapid increases in the productive capacity, the Russian trade is expected to have a major impact on European and Asian markets. The existing oversupply of roundwood has already led to falling raw material costs in Europe. The important link between Russia and China also deserves comment - with trade between the two countries rapidly expanding (e.g. a doubling in sawn softwood trade between 2000 and 2002 (Kosak and Spelter 2003)). The low cost supply from Russia coupled with low cost processing capacity in China will present a formidable competitive axis in years to come.

East and South Asia, which in the 1980s and 1990s was second only to Europe as an exporting region, has greatly reduced its exports of roundwood in recent years and is now a net importer. In addition to the growing scarcity of raw materials this shift has been occasioned by the imposition of export bans or high export taxes. For example, the Indonesian government introduced a ban on the export of unprocessed roundwood in 1981 to be phased in over five years, but soon altered to a 200% export tax in 1991. This initially shifted exports towards sawnwood until in 1989 a similar 200% export tax stimulated a further shift towards plywood. The recent logging ban in China is creating similar market distortion (Macqueen *et al* 2003).

A similar look at the major trends in imports reveals the broader extent of Russia and China's changing roles (Table 2.12). The great expansion in imports in Europe is attributed not just to the increasing demand, but also due to the competitive pricing of Russian softwood timber. The marked increase in Chinese imports reflects the great increase in industrial processing capacity over past decades culminating in the imposition of a logging ban within China itself leading to a significant import demand. To date China is importing roundwood, especially tropical, from many regions, but only Russia and New Zealand have made inroads into its sawn softwood market (Kosak and Spelter 2003).

Table 2.12 World and regional imports of industrial roundwood, 1961–2000 (cum)

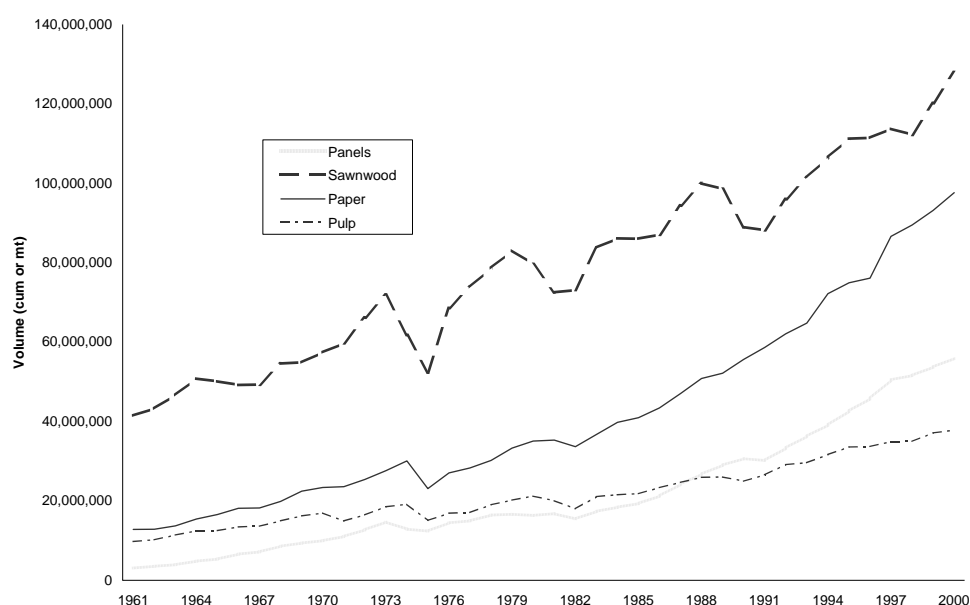
REGION	1961	1971	1981	1991	2000	Annual Change
Total	37,998,500	81,121,504	84,655,500	84,309,953	116,819,487	2.85%
CAC	42,900	58,700	111,200	152,289	101,347	2.17%
ESA	451,200	5,893,400	6,724,100	11,454,348	10,611,715	8.21%
Europe	21,317,300	28,213,400	32,863,700	34,418,517	63,478,539	2.77%
NENA	575,500	755,800	1,200,700	1,816,652	2,457,621	3.70%
Oceania	205,500	134,200	18,200	421,257	773,406	3.37%
S. America	367,300	225,000	136,400	14,307	150,334	-2.21%
SSA	52,400	174,400	175,400	69,164	283,634	4.31%
Former USSR	152,400	114,100	315,600	32,177	1,004,358	4.83%
Canada	1,291,400	2,291,400	2,677,800	2,281,285	4,966,991	3.43%
China	636,800	2,742,000	8,680,600	8,059,028	15,532,332	8.31%
Japan	9,039,900	38,195,904	30,061,600	25,372,062	15,948,000	1.43%
USA	3,865,900	2,323,200	1,690,200	218,867	1,511,210	-2.32%
Tropical	325,400	2,352,900	1,406,700	3,212,812	5,002,819	7.07%
Non-tropical	37,673,100	78,768,604	83,248,800	81,097,141	111,816,668	2.76%

Source: Calculated from the FAOSTAT on-line database (2002) and FAO (2001c).

Trade in all processed products is increasing in volume terms and as a percentage of production (see Figures 2.6 and 2.7). As with production trends, trade in paper is growing at the fastest and steadiest rate. Trade in sawnwood is also increasing but with considerable fluctuations. Panels trade has increased significantly over the last 20 years and has overtaken pulp.

From Figure 2.7 which shows trade in each product as a proportion of production it can be seen that trade is becoming more important – paper and sawnwood have both gone from less than 20% of production going to export at the beginning of the 1960s to around 30% in the late 1990s. Panels have become more of an export commodity since the mid 1980s, with over 30% of production now being traded internationally.

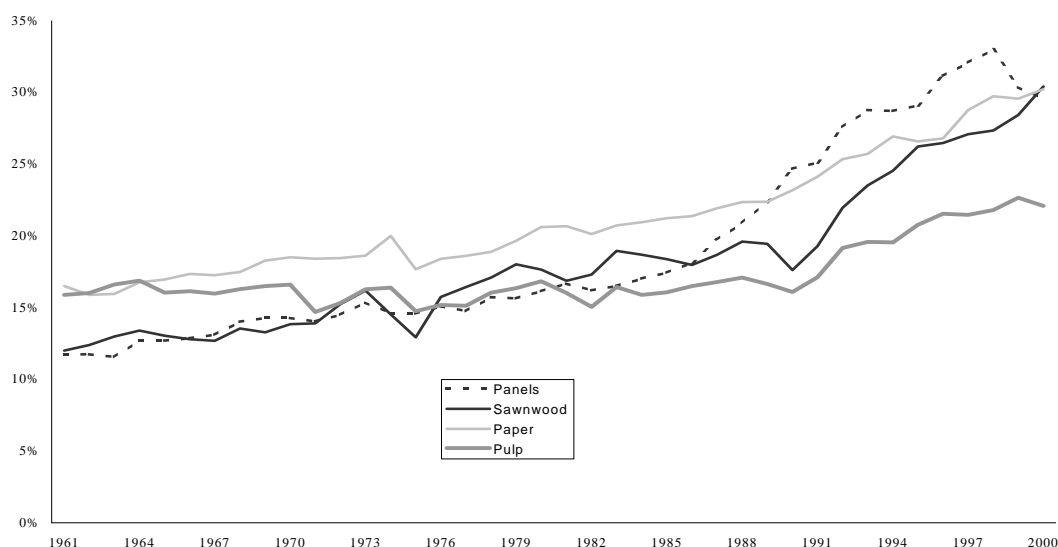
Figure 2.6 Volume of each category exported, 1961–2000



Source: Calculated from the FAOSTAT on-line database (2002).

Despite the considerable increase in international trade, the majority of production, as for industrial roundwood is destined for domestic markets in producing countries (figures 2.8 a-d)) This is particularly evident for all four product categories for some major producers, the US, Japan and China for all four product categories, but also applies to smaller producing regions such as Central American and Caribbean, and Near East and North Africa. Exceptions to this general observation include Europe where although international trade is sizeable in relation to domestic trade, much of this has its origins in intra-regional trade within the EU. Canada also proves to be an exception with its limited domestic market and its orientation towards exports, particularly to the USA. In between these two extremes, some regions have significant export orientation for one of the product categories but not the others, for example in East and South Asia and in Oceania, the export of panels exceeds domestic trade but export is relatively less significant for the other product categories. The same pattern applies in South America where pulp is the only significant export product and the ex-USSR where sawnwood is the key export.

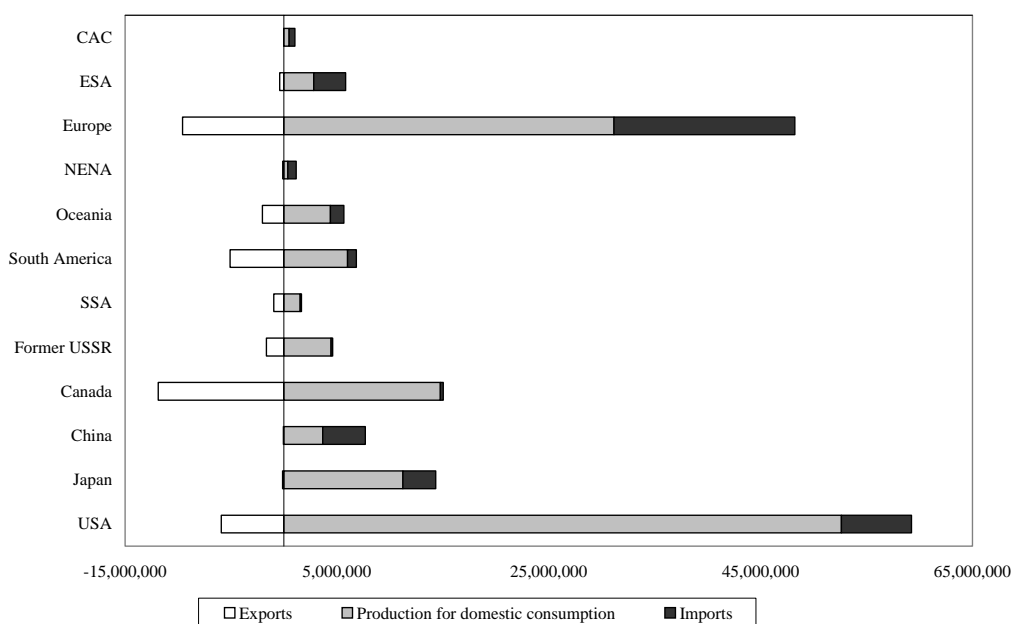
Figure 2.7 Estimated proportion of processed wood production that enters international trade, 1961–2000



Source: Calculated from the FAOSTAT on-line database (2002).

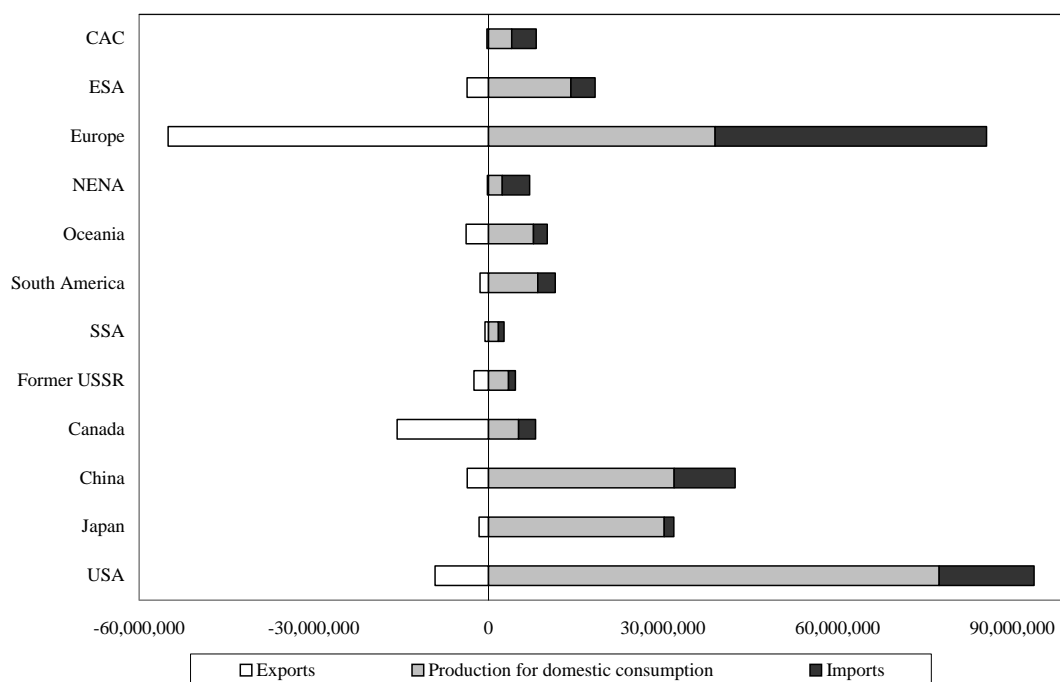
Figure 2.8 Wood product balances by region and product category, 2000

(a) Pulp (metric tonnes):



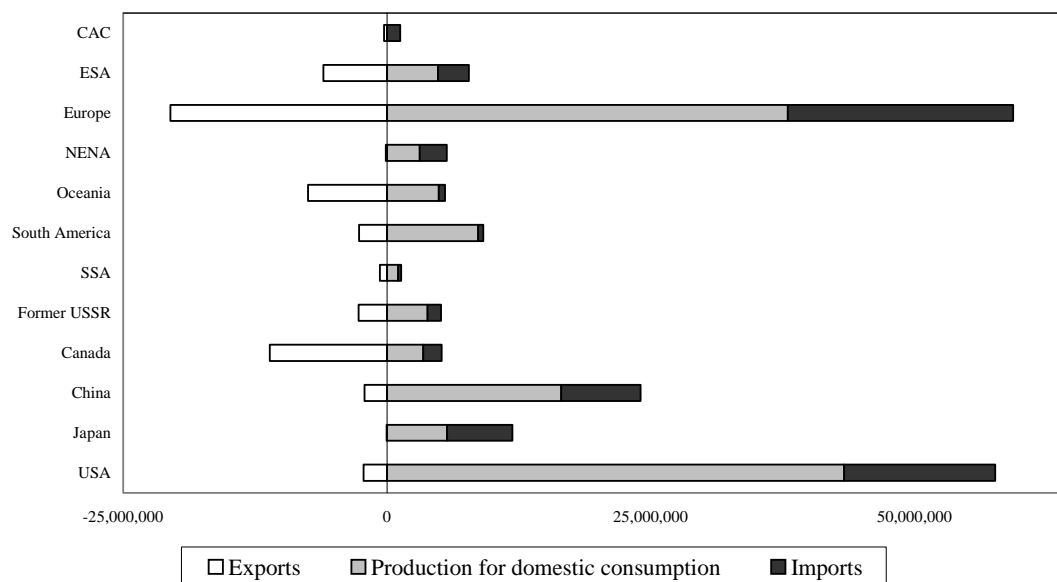
Source: Calculated from the FAOSTAT on-line database (2002).

(b) Paper (metric tonnes):



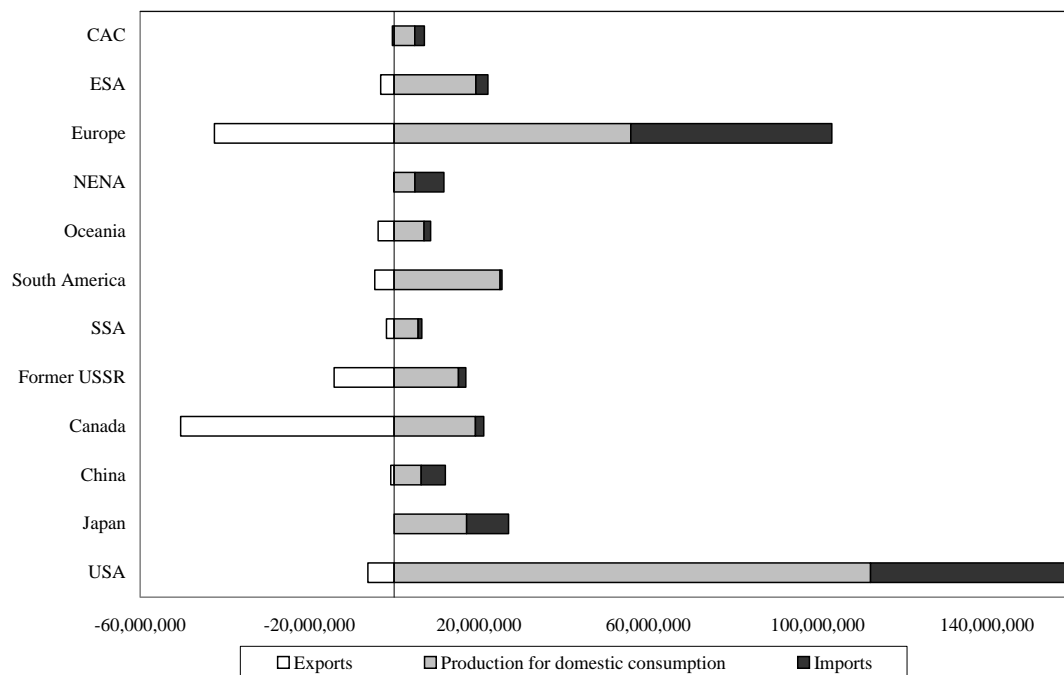
Source: Calculated from the FAOSTAT on-line database (2002).

(c) Panels (cubic metres):



Source: Calculated from the FAOSTAT on-line database (2002).

(d) Sawnwood (cubic metres):



Source: Macqueen *et al.* 2003 from FRA 2000.

Kozak and Spelter (2003) observe that Russian exports of sawn softwood now exceed those of the entire former USSR for the first time, having increased by 17% over the previous year. They now total 8.6 million cubic metres, equivalent to 44% of total production. This surge in exports reflects the depreciation of the Russian currency and stagnant domestic consumption. Already driving down prices in adjacent markets, the full impact remains to be seen as the production capacity of Russian sawmills continues to expand.

The other notable story is the rapid expansion of South East Asian panel production. The rapid development of Asian processing capacity in this sector was in response to investment policies coupled with export bans and export taxes on industrial roundwood and sawnwood exports. In one component of panel production, plywood, the trade became dominated by South East Asia and tropical plywood exports managed to capture 70% of the global market in the early 1990s (Rytkonen 2003). Over capacity in South East Asia which has led to the exhaustion of accessible raw material is at least partly responsible for the subsequent loss of market share in tropical plywood which currently stands at less than 60%. The implications of distorting trade policies for long term production in Indonesia are detailed in Macqueen *et al.* (2003).

Developed or non-tropical countries currently dominate exports in all four product categories but South America now accounts for over 13% of world exports of pulp, and East and South Asia corresponds to over 10% of world exports of panels.¹⁸

Owing to the characteristics of their market, SPWPs are best assessed using value traded rather than volume traded. The value traded in furniture makes it by far the most important category of SPWP, accounting for more than 60% of the export value of SPWPs from ITTO consumer countries, compared with 15.3% for builders woodwork, and 15.1% for other SPWPs (ITTO 2002)..

With exports of US\$ 6 billion, Italy is the world's largest exporter of SPWPs - most of its production being imported by fellow EU members (led by Germany France and the UK) and the USA (ITTO 2002). China (exporting US\$ 4.5 billion) and Canada are the second and third largest exporters of SPWPs with growth in exports of 56% and 52% respectively between 1997 and 2001 (ITTO 2002). While Canada has been

¹⁸ Calculated from data for 2000 in FAOSTAT on-line database (2002)

benefiting from the demanding USA market, China has leapt above Germany (fourth largest exporter) and Canada in exports due to a strong policy encouraging downstream processing, low wages and substantial inward investment from USA, Taiwan, Singapore and other South East Asian neighbours (ITTO 2002).

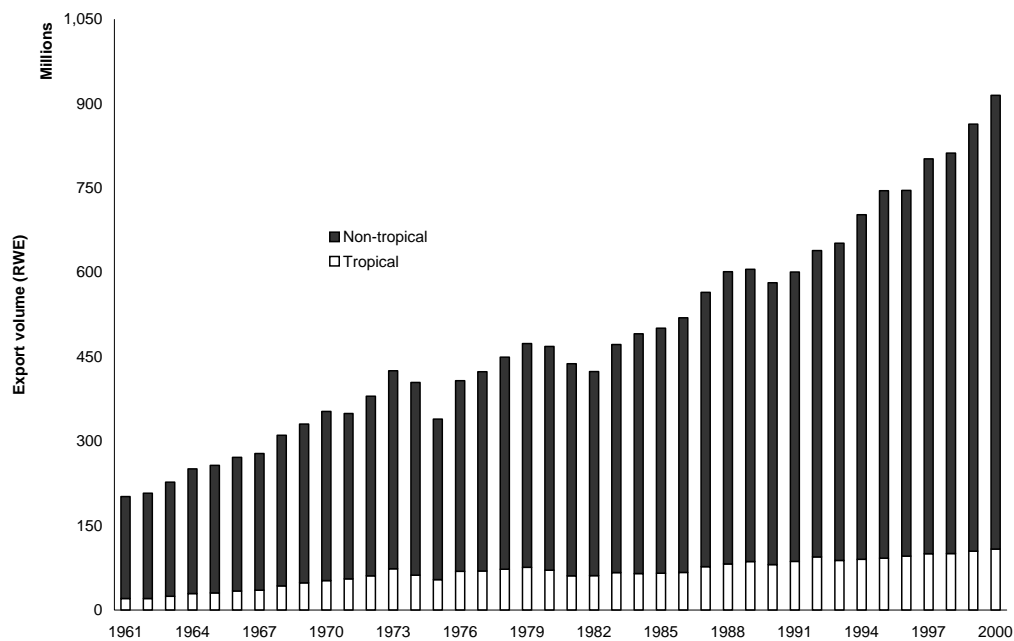
Despite suffering a drop of almost 50% due to the Asian financial crisis in 1998, Indonesian SPWP exports rebounded by 167% in 2000 to surpass Poland as the world's fifth largest exporter. Malaysia, while less affected by the Asian financial crisis, also managed to grow exports by 14% between 1997-2001 to overtake the USA in production (ITTO 2002). The expansion in Asian production and exports has led to falling production in some regions such as the USA which have struggled to remain competitive. The shift towards China has also been to the detriment of European and Canadian producers (ITTO 2002).

In terms of furniture imports, the USA is the largest importer (33%) followed by Germany (10%) France (8%) the United Kingdom (7%) and Japan (6%). The USA, Germany and Japan dominate imports for the smaller builder's woodwork imports, although declining markets in Germany and Japan led to an overall fall in world imports (Tissari 2003). The significant inroads made by developing countries into SPWP trade might suggest a route towards growth and prosperity. Yet Tissari (2003) cautions against over-optimism due to the steady decline in real prices - with a Windsor style chair seat made of rubberwood declining from US\$ 11 five years ago to US\$ 5 in Vietnam in 2003. This author offers engineered wood products (EWPs) as one alternative SPWP sector with a brighter future in the globalised market place.

Trends for tropical and non-tropical countries

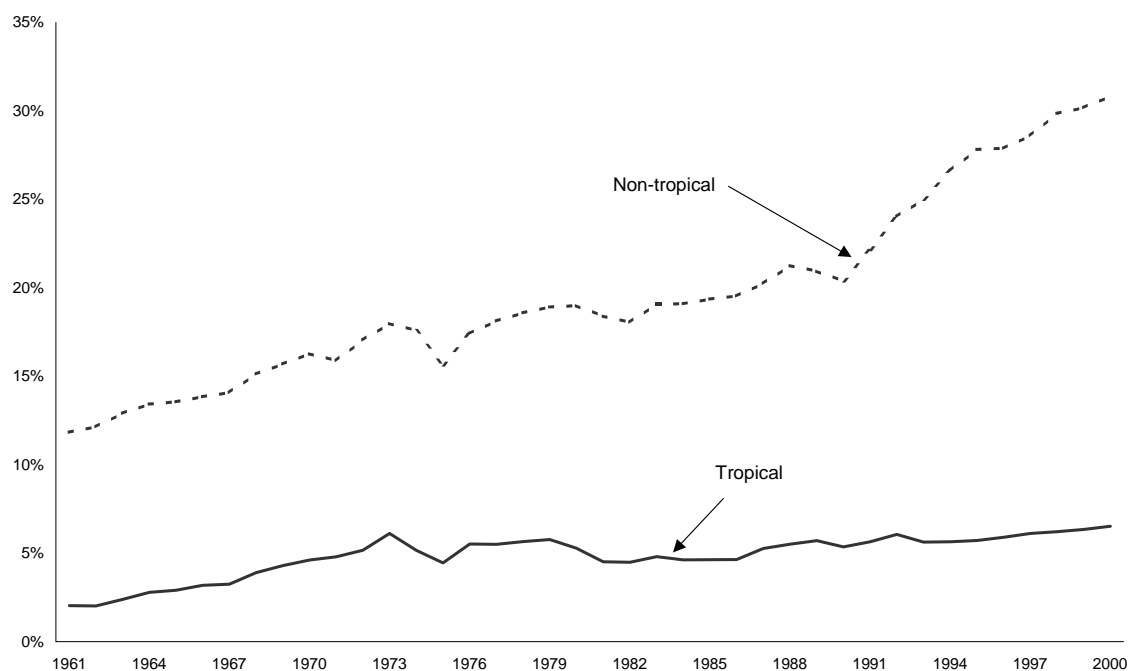
Despite significant country exceptions, there has been a marked general difference between tropical and non-tropical countries in relation to export trends. In roundwood equivalent terms, exports from non-tropical countries have increased both in volume and as a proportion of timber felled. In tropical countries, exports have been static, increasing very little after the 1970s both in absolute terms and as a percentage of production (see Figures 2.9 and 2.10). While only about 5% of roundwood harvested in tropical countries in aggregate is exported, this hides considerable variation between countries. In a number of countries such as Indonesia, Malaysia, and Cameroon, the proportion traded is considerably higher. We have already noted the South East Asian dominance of the plywood markets in the early 1990s and the upsurge in the SPWP markets. Nevertheless, the general impression remains.

Figure 2.9 Volume of roundwood exports (RWE), 1961-2000



Source: IIED calculation based on the FAOSTAT on-line database (2002).

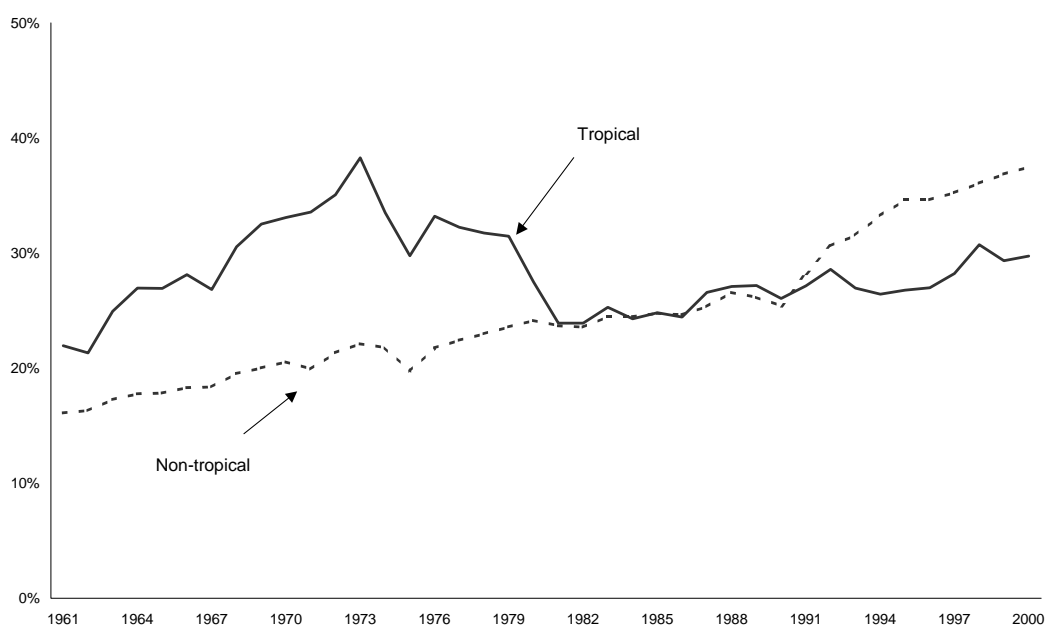
Figure 2.10 Exports of wood products (RWE) as a proportion of roundwood production, 1961–2000



Source: Calculated from the FAOSTAT on-line database (2002).

In relation to industrial roundwood, the significance of trade is greater, particularly for tropical countries. Until the late 1970s, as Figure 2.11 shows, exports of forest products were more important in relation to total industrial roundwood production in tropical countries than in non-tropical countries. Since then they have stagnated somewhat. Although exports have been increasing in relative terms in tropical countries since the early 1990s and now average around 28%, they have yet to regain the significant role they held in the early 1970s.

Figure 2.11 Roundwood and processed wood product exports (RWE) as a percentage of industrial roundwood felled, 1961-2000



Source: Calculated from the FAOSTAT on-line database (2002).

Value of wood products trade

The value of world trade in the main categories of wood products is estimated at approximately US\$ 140 billion in 1997, with paper accounting for nearly half of this (see Table 2.13). An alternative estimate of US\$155 billion (it includes wood manufactures and other minor wood products as well as the five product categories in Table 2.13) is given by Wardle and Michie (2001) who calculate that in real terms the value of trade in forest products increased fivefold between 1962 and 1997. The two regions that saw a major increase in the value of the wood product exports over this period were Asia Pacific and Latin America and Caribbean. These regions both doubled their share of the world value of exports in this period. This reflects both an expansion in trade in volume terms and a shift to trade in more value-added products. The trade in tropical timber accounted for only US\$ 16 billion in 2000 - roughly 10% of the total (Rytkonen 2002). The trade in SPWPs adds approximately US\$ 40 billion to the total.

Table 2.13 Value of world trade in wood products by wood product category, (1997)

Category	Exports (US\$ bn)	% of total	Imports (US\$ bn)	% of total
Total	138.3	100.0	145.0	100.0
Roundwood	9.9	7.1	12.5	8.6
Sawnwood	25.7	18.6	28.8	19.9
Panels	17.1	12.4	17.2	11.9
Pulp	17.5	12.6	18.8	13.0
Paper	67.6	48.9	67.1	46.3

Source: Peck (2001)

Directions of trade in wood products

Intra-regional trade flows account for the bulk of world trade. Table 2.14 shows an assessment of the three main international trade flows in volume terms for each of the main wood products. It can be seen that most of these are within the same region, in particular between Canada and the USA, within Europe; and within East and South Asia. Indeed, Europe, North America and Asia primarily trade internally with only one-third of exports leaving each region (ILO 2001).

Table 2.14 Main wood product trade flows

Product category	Main Trade Flows (based on volume)
Industrial roundwood	Intra-Europe Former USSR to Europe Former USSR to East and South Asia
Sawnwood	Intra-North America Intra-Europe Intra-East and South Asia
Panels	Intra-East and South Asia Intra-Europe Intra-North America
Paper	North America to East and South Asia Intra-Europe Intra-North America

Source: Peck (2001) and FAOSTAT (2002).

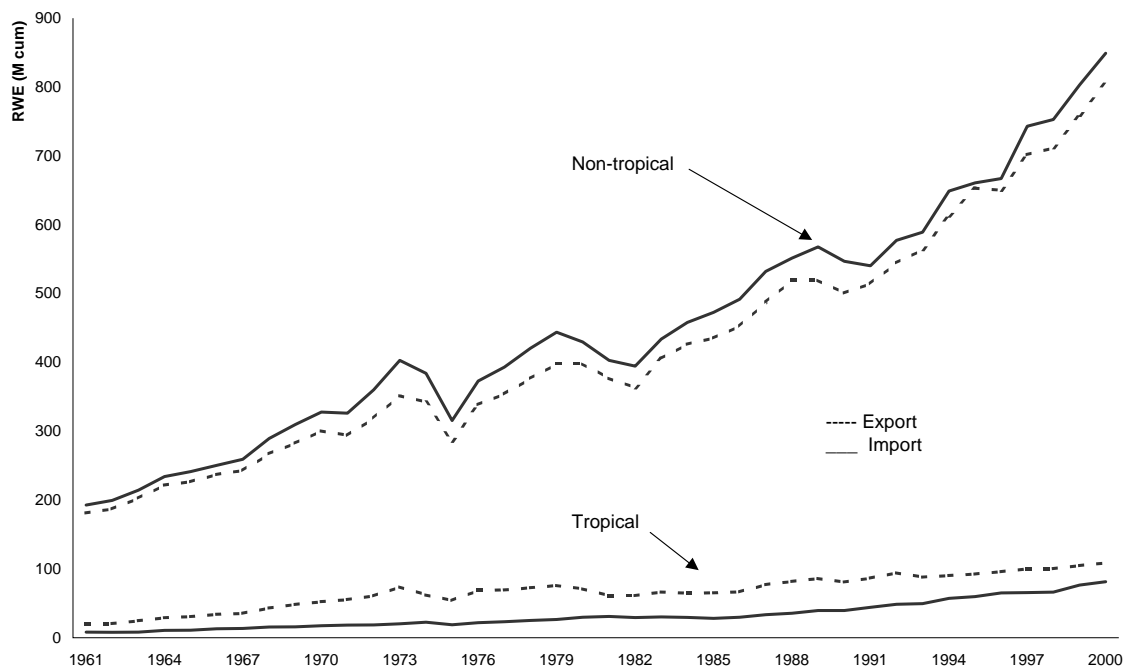
For tropical timber, the emergence of China as the world's largest importer of tropical logs, sawnwood and veneer, means that trade flows within the Asian region predominate. According to ITTO (2002) in 2001, the three largest trade flows of tropical logs were from Malaysia to China and to Japan, and from Indonesia to China. For European importers, the main source of supply was West and Central Africa. For tropical sawnwood, there was a similar pattern with the largest trade flows being from Indonesia to China, and Malaysia to Thailand and China. In the case of tropical veneer, a large proportion of exports were from Malaysia to China and other Asian countries. Trade in tropical plywood was also primarily between Asian countries, with imports by Japan from Indonesia and Malaysia accounting for 46% of world imports.¹⁹

The intra-regional concentration of trade flows is also evident when trade is considered in value terms. According to Wardle and Michie (2001) in 1997, 78% of Europe's forest product imports in value terms came from within the region. Moreover, this was up from 70% in 1962. Similarly, these authors found an increasing emphasis on intra-regional trade in Asia and the Pacific where in 1997, 81% of exports in value terms stayed within the region, compared with 55% in 1962.

Regions have been changing their net trade balances over time. There have been relatively recent transformations of some regions into net exporters during the mid-1970s to mid-1980s. Indeed, between 1961–76 only Canada and Former USSR recorded net exports. During the subsequent decade they were joined by Sub-Saharan Africa, Oceania and South America.²⁰

Traditional directions of trade between tropical and temperate countries are showing some signs of change as shown in Figure 2.12. In non-tropical countries as a group, exports for many years were lower than imports and the trend until the late 1980s was for the gap between them to widen. In the early and mid 1990s, exports caught up with imports but in the late 1990s were overtaken again by imports. This group of countries remain net importers of wood products in volume terms. In tropical countries as a group, imports have been steadily increasing in volume relative to exports. This group of countries are still net exporters but the gap between imports and exports is narrowing.

Figure 2.12 Estimated net trade in non-tropical and tropical countries (RWE), 1961–2000



Source: Calculated from the FAOSTAT on-line database (2002).

¹⁹ Calculated from Table 2.4 in ITTO (2002)

²⁰ See for instance Barbier *et al.* (1994).

2.3.4 Forecasts and Implications

There are differences in views on the direction of future trade and production patterns but there is clear consensus in five areas:

Increasing consumption and production (see Table 2.15); Increasing population, greater urbanisation and rising incomes will result in continued strong growth in global consumption of most products. It is anticipated that consumption will grow most rapidly in developing countries where many countries may move from being net exporters to net importers in some forest product categories.

Table 2.15 Comparison of projections of world consumption of industrial wood (RWE) to 2020

Source	Year of publication	2010*	2020*
FAO	1995	2.28	
Sedjo and Lyon	1995	1.97	2.14
Jaako Poyry	1995	1.94	2.25
Brooks	1996	2.03	2.16
Zhu <i>et al</i>	1998	1.88	

* in billions m³

Source: Peck, 2001

With regard to increasing proportions of plantation wood in timber trade, market forces, low tariff barriers and the growing concern over environmental degradation and illegal logging will continue to shift production towards the most efficient and controllable locations, namely plantations (particularly high growth rate tropical plantations) and semi-natural forests (particularly in temperate and boreal regions). The drive to restrict production volumes in natural forests to the annual allowable cut and to curb illegality will further exacerbate this trend.

Increasing trade-output ratios; While domestic markets will continue to dominate trade statistics in many areas, falling tariff barriers are likely to prompt increasing numbers of consumers to widen their search for lower cost and greater quality across national boundaries.

Increasing shift towards processed and SPWPs trade with gradual inroads by developing countries. The developed countries will continue to maintain market share through attention to technology and product design but it is expected that the burgeoning technical capacity in developing nations, coupled with low wages, ample natural resources and policies directed towards value adding processing will continue to drive the shift towards exports in processed and SPWPs from developing nations - although the nature of these exports may vary over time.

The consolidated position of some emerging exporters and importers (e.g. Russia and China). The emergence of Russia and China as major exporters is likely to continue as capacity development has yet to reach its full potential. In China's case this will also involve continued expansion as a major importer of industrial roundwood and sawnwood. Brazil may also be expected to consolidate its position in world markets due to its resource abundance and growing technological proficiency.

The forecasts described above depend heavily on assumptions about technological innovation and political stability. We are right to be cautious about predictions, since factors such as the break-up of the USSR led to changes in trade patterns that were largely unforeseen. There are three important reasons why future forecasts are increasingly risky:

Political and social instability - the growing scarcity of renewable and non-renewable resources, growing global inequality and a rise in unilateralism need to be factored into any future predictions under the current model of globalisation;

Environmental instability - the current rates of economic growth are both based on non-renewable energy resources and have major climatic and environmental consequences. It would be unwise to take as read that global consumption will be able to continue growing at its current rate.

Economic instability - the measures required to correct the market externalities implicit in the growing political and environmental instability may require dramatic shifts in economic policy. The rapid development of markets for environmental services is but one of the measures that may be required to promote sustainability, and which will have far reaching consequences for forest cover and timber production.

Global trade in forest products has increased over the last forty years in both value and volume terms, raising questions about the possible impact on forest management. Statistics on land area, forest area, demographic patterns and income show considerable variation such that it is not possible to draw simple conclusions about the impacts of trade and increased economic activity. The relationships between deforestation and population and economic pressures are complex and highly location-specific. It is also important that roughly half of total roundwood production consists of fuelwood, very little of which is traded internationally.

There are few available indicators of sustainable forest management worldwide, apart from the area covered by certification systems and the extent of forest loss. Certification has been expanding rapidly and the different schemes in existence have certified just over 4% of total forest area worldwide. However, most of the area certified is in non-tropical countries and in plantations or semi-natural forest.

By way of contrast, natural forest areas appear to be contracting worldwide. There is some small net expansion in non-tropical areas but a much greater net loss in tropical countries. Natural forest loss is likely to continue as production shifts to more competitive land uses and more intensive and efficient forest production systems such as plantations and semi-natural forests. While trade in certified products may be a means for promoting sustainable forest management, it is not clear that it can do much to make SFM in natural tropical forests competitive with plantations and semi-natural forests.

Plantations alone are likely to provide up to one half of all industrial supply within 15 years. Since many plantations are heavily subsidised, either directly or indirectly, this further tips the scales against natural forests and undermines the value of natural forests and their potential for investment and trade (as well as conservation).

Domestic trade in forest products is still more important in volume terms than international trade in all regions and most countries. The proportion of timber from tropical countries that enters international trade is particularly small, (about 5% of roundwood and 28% of industrial roundwood felled). This suggests that the export market may not be the most relevant target for addressing problems of forest management. But international trade is increasing for both tropical and non-tropical countries, although at a faster rate in the latter, and this trend is projected to continue.

Europe and the USA are among the principal importers, exporters and consumers of forest products. This suggests a role for trade in linking environmentally sensitive consumers in these regions to producers, particularly those in tropical countries where the domestic market is less interested in environmental concerns. But intra-regional trade accounts for the bulk of all international trade in both volume and value terms, indicating that transport and logistics costs still represent the major determinants of trade patterns. In these circumstances, increasing environmental requirements on the part of buyers in Europe and the USA may intensify these patterns.

There are major new players emerging into the international markets, the foremost of which are China (imports and exports) and Russia (exports). The full extent to which their emergence is likely to shift trade patterns remains to be seen, but it is known that further capacity development in both countries is highly likely.

Tropical countries which for many years were considered as suppliers of forest products, particularly logs and sawnwood, to Northern markets (although the majority of production was apparently for domestic consumption) are seeing their imports of wood catching up with their exports, when considered as a group. They also appear to be shifting production and export into more processed products such as SPWPs, paper and pulp.

2.4 Wood Fuels and Wood Energy

Fuelwood production has been expanding at 1% per annum on average worldwide since 1961.²¹ However, its use is declining in some regions (Canada, Japan, NENA, Oceania, Europe and Former USSR), and expanding in others (notably in SSA, China and the USA). Tropical countries produce over 70% of all fuelwood and over the period 1961 to 2000 have been expanding production at double the rate of non-tropical countries.²² Globally, fuelwood accounts for 7-11% of energy consumption (IEA 1998; FAO2001c) but developing countries account for 90% of global fuelwood use (ABARE and Jaako Poyry 1999) Indeed, 80% of wood harvested in developing countries is consumed as fuel (FAO 2001c), accounting for 15-35% (WEC 1999; IEA 1998) of total energy use.

The volume of wood destined for fuelwood (approximately half of global production as can be seen in Figure 2.2) suggests that forest management at the landscape level is likely to be affected as much by fuelwood use as by industrial roundwood production and trade. It is also important that very little fuelwood is traded internationally. This reflects its relatively low unit value, wide availability and importance for domestic energy supply (Nasi *et al* 2002; Buongiorno *et al* 2002). Shortages of fuelwood are more likely to cause diversification to other fuels (kerosene, coal, dung, etc.) rather than augmentation of supply through international markets.

Woodfuels should always be considered goods or commodities that are valuable and capable of meeting demand effectively. Compared to other renewable energy sources, biofuels are characterized by a wide range of various fuels. These differ in provenance, physical/mechanical properties (e.g. total moisture, particle size and particle size distribution) and chemical composition (e.g. total carbon). In this context the lack of clearly defined biofuel properties as well as clear supply conditions are seen as major non-technical impediments for biofuel trading. In the European Union standardization of biofuels has already been started.

Electricity is the single most important energy sector as it accounts for about 40% of gross energy consumption in EU 15. Access for renewables to the electricity networks at fair prices is therefore a critical step for their development. By-products concentrated at industrial processing sites (like bark and saw dust in saw mills) are currently the largest commercially used biomass source. Conversion efficiencies of up to approximately 90 % and above are possible for modern heating units with high-end technology. Electricity production is based mainly on the conventional steam cycle with efficiencies around 30 %.

Almost one third of new additional biomass exploitation by 2010 could fall in combined heat and power (CHP). Increased use of wood fuel-electricity is linked, like that for wind and solar electricity, to fair access to the electricity market. Unlike wind and sunlight, which are for free as energy input, woodfuels also need a trustworthy and liquid pricing scheme for economic measurement. At the end, all wind, sun and wood fuel will have to be measured against feed-in prices for electricity, market-related or not.

Woodfuels in particular are largely traded energy carriers in both formal and informal markets. Woodfuels could make a substantial contribution to cover the given energy demand in an environmentally sound way. Most of the options for using biomass could easily be integrated within the existing energy system. This could allow an easy transfer from the current energy system based mainly on fossil fuel energy in e. g. most industrialized countries to a more sustainable energy system based also on woodfuels.

Although woodfuels from forest residues have a great potential, they are hardly competitive compared to fossil fuels under present circumstances (without taxes) unless a financial support system makes thermal use of biomass lucrative.

For the moment investment projects on new fossil fuel/nuclear power stations are multiplying, whereas much more should be done on the renewable energy side. Financial institutions don't seem comfortable lending to renewable power projects, partly also due to investment risks and the lack of hedging possibilities.

It is the view of this article that emissions trading under Kyoto Protocol will most probably lead to higher energy prices and greatly accelerate the shift from coal (including lignite) to natural gas as the primary

²¹ IIED calculation based on FAOSTAT on-line database (2002)

²² IIED calculation based on FAOSTAT on-line database (2002)

fuel used in power plants. Still, coal plants can evaluate to use woodfuels for a fuel mix with coal, thus reducing their carbon balance. So also from this side a more vivid trading of woodfuels can be expected. The market for woodfuels should be prepared for these challenges, which surely also require some trading mechanisms to be in place.

For the moment, the market environment for woodfuels is difficult to assess. There are no clear product definitions which impacts on the quality of wood fuel statistical numbers. Legal and financial regulations on wood fuel are still under development and change and one need to wait some more years until a clear picture will emerge. Use of woodfuels is on the one hand promoted by EU and governmental policies; on the other hand it still lacks the basis as clear product quality definitions or a standard contract to facilitate trade.

Based on this the future for woodfuels is difficult to assess, while a European market for woodfuels is already in its early stages. On the one hand there are ongoing changes inside the forestry and woodfuel industry; on the other hand a lot of external factors show increasing influence on the market.

Most probably, consumption of woodfuels for heat production will increase in the short-term, while a longer perspective is necessary for combined heat and power (CHP) generation, which still suffers from an unstable regulation environment caused by electricity market liberalization. As in every market, cheap qualities will be used more intensively and only later on a market for more expensive qualities will develop. Wood fuel trade from East European/Baltic countries to Nordic/Central European countries should increase during the next years as well as trade from Nordic/Baltic countries to UK and Benelux countries.

The future development of the wood fuel market will impact on the EU targets on renewable power generation, but cannot fill the gap that would be needed from the energy consumption side, although the market for wood could be more expanded due to forest increases.

One of the crucial aspects of future wood fuel use in energy generation will be the existence of a transparent market and the availability of trading instruments to hedge some of the project risks involved. For the moment the industry structure of woodfuels seems to be satisfied without transparent prices. For this reason, also forward market and exchange trading find an extremely difficult environment. So one can say that a favorable environment for trade of woodfuels exist, whereas most prerequisites for trading of woodfuels still have to be developed and such a market still has a longer way to go. Still, this article foresees that in regions that can easily be reached by bulk sea transports, a true market for woodfuels will emerge. In landlocked regions of continental Europe the development will maybe be a different one.

The most necessary issues in the moment are cost-efficient by-products from forestry and wood industry on the supply side, regulation of the heat/power market on the demand side and the development of a transparent market. Policy-makers and regulators already have and partly still have to create a sound environment of financial and legal regulations. The future development of woodfuels is determined more by economic framework conditions (market standardization, price of fossil energy, and internalization of external costs of fossil energy, feed-in tariffs) than by technology.

2.5 Non-wood Forest Products (NWFP): Trends, Prospects and Constraints

Non-wood forest products (NWFP)²³ play an important role in the daily life and well-being of millions of people worldwide. NWFP include products from forests, from other wooded land and from trees outside the forest. Rural and poor people in particular depend on these products as sources of food, fodder, medicines, gums, resins and construction materials; some 80 percent of the population of the developing world use NWFP for health and nutritional needs. Traded products contribute to the fulfilment of daily needs and provide employment as well as income, particularly for rural people and especially women (FAO, 2001).

²³ There are a variety of definitions for non-wood forest products (NWFP) and the related terms non-timber forest products (NTFP) and non-wood goods and services (NWGS) corresponding to different perceptions and different needs. For the purposes of this paper, the following definition of NWFP is used: "Non-wood forest products are goods of biological origin other than wood, derived from forests, other wooded lands and trees outside the forests" (FAO 1999).

Most NWFP are used for subsistence and in support of small-scale, household-based enterprises. However, NWFP also provide raw materials for large scale-industrial processing for products such as foods and beverages, confectionery, flavourings, perfumes, medicines, paints or polishes.

International trade in NWFP is composed of imports and exports of numerous products at different stages of processing. At least 150 NWFP are of major significance in international trade. The total value of world trade in NWFP is of the order of US\$ 11 billion, of which about 60 percent is imported by the EU, USA and Japan. General direction of trade is from developing to developed countries (FAO, 1993; FAO, 1995).

Most NWFP are traded in rather small quantities, but some such as natural honey, walnuts, gum turpentine, rosin, rattan and gum arabic reach substantial levels. In addition, some 2 500 medicinal and aromatic plants enter international markets (Schippmann et al., 2003). A summary of NWFP of major commercial significance is given in 1 based on the work of FAO (1993; 1995) and updated by preliminary results provided by FAO (2003). which is based on an analysis of relevant Harmonized System commodity (HS-1988) commodities codes for the years 1995 to 2001 inclusive.

Reliable data are mostly unavailable, both on the domestic and the international trade as well as on the sustainability of NWFP production (e.g. resources available and resources exploited). Some information may be available at the local level, on a specific product or in a specific area, but this information generally cannot be extrapolated at the country or regional level. At the national level, production and trade statistics on major NWFP remain the exception. In the best case, available information is restricted to selected products that are of particular interest to specific regions/countries, such as bamboo products in China, rattan in the Philippines, gum arabic in Sudan, or brazil nuts in the Amazon (Killmann et al., 2003).

Reported exports often – but not always – refer to producing countries. Many products are exported as raw material to one country (primary importer) and then (after further processing) re-exported to (secondary) importers. In the case of gum arabic (see table X, plant gums), France (export of 16 714 t worth US\$39 Mio) is reported as main exporter according to the HS system followed by Sudan (24 588 t worth US\$ 20 Mio) and the UK (3 940t worth US\$8 Mio). However, Sudan is the main gum arabic producing country (followed by Chad and Nigeria), while both France and the UK are both importers of raw gum from gum producing countries and (re-exporters of processed gums and gum products. The EU, for example, imported in 1998 38 730 t of gum arabic, consumed 18 978 t and re-exported 19 800t (FAO, 19XX; by Coppen).

Reporting on traded commodities considered as NWFP also incurs the question whether to classify a commodity actually as NWFP or as agricultural crop. Many NWFP are not only collected from the wild but also cultivated in agroforestry systems or agricultural plantations. Most trade data do not distinguish between these different production systems. Wild honey, for example, can be considered as NWFP while the inclusion of cultured honey as a NWFP could be questioned. Nevertheless, because many plants growing in forests and a number of semi-wild trees constitute an important nectar and pollen source for foraging bees at least a part of cultured honey could be considered as NWFP. The actual distinction between wild gathered and cultured honey, however, remains difficult as ‘honey’ trade statistics merge products from all sources (FAO, 1995).

From the foregoing discussion on the commercialisation of NWFP, a number of interesting features, trends, prospects and constraints emerge, which are briefly outlined below.²⁴ NWFP commercialisation provides considerable potentials to contribute to poverty alleviation and food security. Trade in NWFP can act as an engine for rural growth contributing to national incomes; increase the value of NWFP providing better income and employment opportunities; and provide opportunities for (relatively) benign forest use and create incentives for conservation.

For a majority of the developing countries with limited forest resources, in particular low forest cover countries, NWFP are among the main exportable forest products. In Sudan, gum arabic is the fifth most important export commodity after crude oil, sesame, livestock and cotton), worth US\$26 million in 1999 (Economist Intelligence Unit, 2001), contributing to eight percent to the total value of agricultural exports from the country. Gum arabic also provides an important source of income, in particular during the dry

²⁴ Information is mainly based on the discussions held in an email discussion forum in preparation to the side event “Strengthening Global Partnerships to Advance Sustainable Development of NWFP”, organized in the context of the 12th World Forestry Congress, Quebec, Canada (20 September 2003). The email discussion on NWFP commercialisation has been summarized by Belcher & Schreckenber (2003).

"dead" season: some five million Sudanese, 1/5th of the population, are involved in the production and trade of gum arabic. Collection does not only provide income, it also prevents people to migrate to urban areas and to leave (temporary or permanently) the gum belt. Furthermore, it provides various environmental benefits in fragile arid ecosystems, for example combating desertification.

In India, nearly 60 percent of all recorded forest revenues comes from NWFP, although they are primarily exported as raw materials. NWFP are estimated to generate 70% of all employment in the Indian forestry sector – most of India's 50 million tribal people receive a substantial portion of their cash and in-kind income from NWFP. Commercial NWFP alone are estimated to generate US\$100 million annually (FAO, 2002).

A variety of studies tried to assess the potential monetary value of NWFP per area. A comparative analysis of 24 studies showed that the annual benefit per hectare varied between US\$0.75 and US\$420 (Goody et al., 1993). The most known research in this area was carried out by Peters et al. (1989) in Peru, who compared the value of 12 regionally traded fruits and resins with potential timber and grazing benefits. The study concludes that the net present value per hectare derived from trade in fruits and resins reached US\$ 6 330 over a period of 50 years, compared with US\$ 2 960 derived from grazing and US\$ 1 000 from timber trade. Despite these impressive figures, it is difficult to evaluate the real potential value of NWFP and other forest products and services, since it remains difficult to predict supply and demand as well as the development of prices over such a long period (GTZ, 1996).

NWFP are widely used in various industrial sectors such as pharmaceuticals, botanical medicines, cosmetics, food and beverage and paper industries. These industries are interested in NWFP because of their properties, because they can provide cheap and effective (raw) materials (which might substitute existing products) or because they can be marketed as 'exotic' products.

Each destination industry has its own research, manufacturing and marketing requirements. Even the same resource can provide various products for different industries/markets: in the case of shea butter (*Vitellaria paradoxa*), the cosmetic industry prefers a high content of unsaponifiables (requiring early harvest of the kernels and traditional forms of extraction), whereas the food industry prefers the stable product obtained by solvent extraction.

Research in the identification of new, nature-based products is carried out by various industrial sectors, requiring substantial investments of financial resources and time (see key characteristics below). These investments are in direct conflict with the often unstable nature of NWFP markets with its fluctuations in supply and demand.

Box 2.1 Key characteristics of pharmaceutical, botanical medicine and cosmetic industry

	Pharmaceutical industry	Botanical medicine industry	Natural personal care and cosmetic industry
Definition	Industry involved in the discovery and development of new drugs (natural, semi-synthetic, synthetic).*	Industry dealing with botanicals, produced directly from whole plant material.	Segment of the personal care and cosmetic industry, which includes botanical ingredients in their products.**
Years to develop new products	10-15+	<2-5	<2-5
Costs to develop new products (million US\$)	231-500	0.15-7	0.15-7
Annual global sales (billion US\$)	300	40	n/a
Share natural products/all products of global market (in %)	25-50	100	n/a
Market for natural products (billion US\$)	75-150	20-40	2-8

Explication: n/a = Information not available;

* 41 % of the top 150 prescription drugs in the USA contain at least one active compound derived from animal or plant genetic resources (ten Kate and Laird, 1999).

** The natural segment of this industry is estimated to 10 percent of the total sales (ten Kate and Laird, 1999).

Source: Walter et al. (2003)

A key aspect for the development of international markets, from a local or regional perspective, is the supply of NWFP. NWFP are often produced in small volumes, dispersed over wide areas. Particularly wild harvested products can be very unreliable in quantities and qualities due to the biology of the organism, climate conditions and other socio-economic factors (e.g. competing opportunities for producers, tenure systems, local knowledge). Moreover, forest products are almost by definition coming from remote areas with poorly developed communications and transportation infrastructure. Under these conditions, it is often difficult and costly to move products to market.

The development of local/domestic markets is often demand driven. Increased production in a stagnant market is likely to lead to depressed prices and reduced incomes – therefore the potential to expand domestic markets and market demand is a key issue.

Fluctuations in supply – the example gum Arabic

Reduction in supplies caused by two droughts in a period of 10 years resulted in disruption in manufacture of the products containing gum arabic, which led the manufacturers to replace gum arabic with newly developed modified starches. Consequent price hikes made switching over to the substitutes economically feasible. Decisions concerning commercial reformulations for an established product are never taken lightly, and are almost always irreversible, because extensive modifications to manufacturing equipment are involved. Consequently, demand of gum arabic in international market was brought down from 70 000 tonnes in 1970s to 20 000 t in 1980s. Improved supply enhanced increasing market demand reaching world exports of 55 000 t in 2001.

As long as access to markets is ensured, the most important challenge, in particular for export markets, is to maintain/increase quality and quantity of production at competitive prices. Only few low-income countries have the high degree of infrastructural and institutional development, strict quality control and sophisticated supply chain management practices necessary to enter international markets. Positive examples include spices from Asia and gum arabic from Africa. Because of these concerns, it is argued that selling products to mainstream markets is probably beyond most NWFP producers and that therefore a variety of 'green' and 'fair trade' niche markets could be the most useful starting point (Laird and Guillén, 2002; quoted by Belcher & Schreckenberg, 2003).

Many NWFP are not only exported with minor processing (e.g. brazil nuts, vanilla, wild harvested rubber, baskets) but they are used as ingredients in very sophisticated industries. A high degree of technological innovation may be necessary to achieve value-added in the country of origin at the same time as meeting the quality standards of demanding international clients. Governments often promote these required technical innovations by providing incentives (direct subsidies, research, etc.) for the establishment of processing units in producer countries (e.g. kibbling plants for gum arabic in Africa) or by banning exports of raw and semi-processed products (e.g. rattans in Asia).

Once markets for NWFP are well developed, larger operations can easily duplicate production and manufacturing processes for less cost, in less time and with more efficiency of scale (Ervin and Mallet, 2002; quoted by Belcher & Schreckenberg, 2003). Although this is not necessarily a bad approach, it may result in shifting control and benefits to other stakeholders.

Increasing commercial demand in NWFP often gives a strong incentive for increased production and can have negative conservation impacts. Increased production can be achieved through ore extensive harvesting (harvesting from a larger area); more intensive harvesting (harvesting more per unit area); or intensified management (management of wild resources or domestication/ cultivation).

In many cases, the expansion of harvested areas is not possible, since the land and resource base is limited and the competition among harvesters is too high. An increasing harvesting intensity will often lead to an over-exploitation of wild resources. Particularly in open-access conditions, the increased value can lead to uncontrolled competition for resources and to detrimental harvests.

An intensification of management of wild resources and/or the domestication/cultivation of resources providing NWFP is often reported as suitable option to increase the quantity of production and – in addition – to provide better qualities. High external demand is the key driving force often leading to the substitution of wild gathered NWFP by cultivated agricultural products. Consequently, many NWFP producers have to compete with large-scale cultivation within their own or in other countries. The

livelihoods of Brazilian natural rubber harvesters, for example, were turned upside down by the massive production of plantation rubber from South-East Asia. Today, world trade in natural rubber is dominated by Indonesia and Malaysia, the world's leading producers accounting for 47 percent of the world's total production in 1992 (FAO, 1995).

NWFP markets are also vulnerable to substitution by synthetic products. A classical 'boom and bust' experience is the case of natural chicle. Chicle fuelled the modern chewing gum industry and its extraction was the main industry in the Yucatan Peninsula of Mexico in the mid 20th Century. But, by 1960, the development of much cheaper petroleum-based gum had almost eradicated demand for natural chicle (Laird and Guillén, 2002; quoted by Belcher & Schreckenber). On the contrary, gum arabic could maintain its position (after the chock in the 1980s) on the world market due to its better properties compared to other substitutes.

Trade in NWFP provide income and employment opportunities for many people, in particular poor populations living in rural areas. Increased commercialisation can improve local livelihoods but it can also have the opposite effect through over-exploitation and/or changing property rights (including intellectual property rights and the related discussions on access and benefit-sharing). Therefore, there is a risk that commercialisation leads to increased 'privatization' of resources and to the exclusion of certain (mainly local and poor) groups from the benefits - in a way that poor local people are left worse off and more vulnerable.

2.6 Markets for Forest Environmental Services

In addition to a broad range of various goods (e.g. timber, woodfuels and NWFP), forests provide many ecosystem services which are categorised as environmental services. They can be related to the regeneration of natural resources, the stabilisation of processes and to various life-fulfilling functions.

In this study, the concept of *forest environmental services* refers to *ecosystem services provided by forest ecosystems*. The term "ecosystem services" has been coined to describe the processes and conditions by which natural ecosystems sustain and fulfil human life (e.g. Daily 1997, Mooney & Ehrlich 1997). Sometimes ecosystem services are also called functions. However, ecosystem functions are biophysical processes that take place within an ecosystem and can be characterised apart from any human context, e.g. cycling carbon. Ecosystem services are desirable outcomes (flood mitigation, lower global warming, etc.) from ecosystem functions that benefit human beings. This definition is anthropocentric and utilitarian emphasising instrumental values. Forest ecosystem services have also intrinsic or inherent values but such notions of value do not easily lend for trading.

Three fundamental kinds of *environmental service categories* are customarily recognised (Winpenny 1991, Pearce & Moran 1994): (i) *General life support*: genetic pool/knowledge, climate regulation, carbon fixing, habitat, aesthetic, cultural and spiritual source, scientific data, genetic insurance; (ii) *Sources of materials and services*: timber, fuelwood, NWFP), ecosystem (e.g. agricultural) productivity, landscape beauty/ecotourism/recreation, watershed protection, water filtration, regulation of waterflows, insect pest control, pollination; (iii) *Absorption of waste products of economic and social activity*: recycling nutrients, protecting soil quality, absorption of waste, salinity mitigation.

The list of services provided by forests is even broader than depicted here (see e.g., Myers 1997, Pearce & Pearce 2001). However, most of them are not (yet) tradable. There are no markets or markets are extremely thin because of too high transaction costs, problems with (lack of) rivalry and excludability, inadequate demand because of lack of awareness, problems with defining ownership, and high uncertainty about service attributes.

Based on an *ex ante* assessment of the tradability aspect, existing market evidence, and the potential impact on forest product trade, this study will concentrate on the following forest ecosystem service categories:

- Biodiversity (insurance service, source of knowledge/information, role in maintaining other ecosystem services)
- Carbon sequestration
- Watershed protection, including water supply services and soil conservation
- Forest landscape beauty (forest-based tourism)

These forest-based services have received most of the attention in the development of markets for environmental services (Landell-Mills & Porras 2002; Pagiola *et al.* 2002; Nasi *et al.* 2002). They also comprise the core of the World Bank's (WB) Payment for Environmental Services Programme (www.worldbank.org/environmental_economics).

In most cases, the values of these services are captured by selling associated commodities²⁵, which also sometimes serve as proxies for the actual service. A proxy may be needed when it is difficult to come up with a clearly defined service that can be directly traded. The number of commodities used to market environmental services is quite large; consequently this study concentrates more on those commodities, which may have significant impacts on international trade and sustainable forest management.

It is also important to clarify the notion of an *economic value of forest ecosystem services* that the markets try to capture. Ecosystem values are measures of how important ecosystem services are to people in terms of willingness to pay. In strict economic terms, the full value of an ecosystem expressed in monetary terms would be the sum of each person's willingness to pay for each service generated by each ecosystem function. Forest ecosystem services and related products can be grouped under two categories: use values (direct, indirect and option value) and non-use values (bequest and existence value), which together form the total economic value demonstrates these values (Table 2.16).

Table 2.16 Total Economic Value of a Forest and Environmental Services

Use Values			Non-use Values	
(1) Direct value	(2) Indirect use values	(3) Option values	(4) Bequest values	(5) Existence values
Outputs directly consumable: Timber Fuelwood Non-timber forest products, including medicines, food, resins, etc. (Ecotourism)	Functional benefits Watershed protection Flood control Soil erosions control Landscape beauty (ecotourism) recreation and tourism Soil fertility/ Nutrient cycling Climate mitigation Carbon sequestration Biodiversity	Future direct and indirect uses per (1) and (2), including: Biodiversity Conserved habitats	Use and non-use value of environmental legacy Habitats Prevention of irreversible changes Cultural heritage Biodiversity	Value from knowledge of continued existence Habitats Endangered species Genetic

Source: Modified from Pearce & Moran (1994)

At present, extensive markets exist only for forest products, such as timber, that are directly consumable. Markets rarely exist for ecosystem services, which fall largely under indirect use values, i.e. functional benefits derived from forests. Forest environmental services, such as watershed protection and biodiversity conservation, cannot be commonly traded in the market mainly because in most cases they can be considered as public goods with significant characteristics of non-rivalry and non-excludability. Furthermore, they often produce positive externalities, and sometimes also negative externalities. As a consequence, markets will not by themselves optimally allocate resources to sustainable management of forest resources to produce environmental goods and services, and they will not constrain production of environmental "bads" such as downstream siltation caused by unsustainable land-uses upstream. Market failures result in under-production of public goods such as watershed and biodiversity protection or carbon sequestration, which is reflected in under-investment in the protection of existing forests and the establishment and management of new forests (Pearce & Moran 1994, Landell-Mills & Porras 2002, Nasi *et al.* 2002).

²⁵ A commodity is a an article of trade; a concrete thing desired by purchasers, possessing utility and available in limited supply (New Webster's Dictionary and Thesaurus 1992).

LINKAGES WITH TRADE NEGOTIATIONS

The WTO agreements, including GATT and GATS, do not define “environmental goods” and the definition of “environmental services” is limited to end-of-pipe activities, not explicitly covering sustainable management of natural resources. The coverage of trade negotiations remains uncertain in this respect. Definitions will have implications for the competitive advantage of environmental goods and services, national sovereignty in regulating environmental service and good delivery (sustainable development), and the nature and level of service provision (e.g., marketing of shade-grown coffee or eco-labelled forest products). Definitions may also influence the competitiveness of individual countries in the production of wood and non-wood products.

Carbon, biodiversity and water services of forests may be significantly affected by the Doha Round. As regards carbon, the main issue is the potential conflict between the still-evolving rules for CDM-based emission trade under the Kyoto Protocol and the WTO, particularly GATS. How this potential conflict is addressed could have major implications for how CDM projects are implemented. The potential impacts of including the protection of biodiversity and landscape as environmental services in the WTO definitions are not yet adequately known and stakeholders have different views on them. In the area of water, the key issue has been opening service delivery to international competition. Defining water resource as an environmental service would broaden the view making watershed management an environmental service subject to GATS regulations. However, many definitional proposals are vague and do not allow a ready assessment of their relevance for markets for forest-based environmental services and sustainable forest management.

IMPACTS OF ENVIRONMENTAL SERVICES ON FOREST PRODUCTS TRADE AND SUSTAINABLE FOREST MANAGEMENT

Markets for forest environmental services are still relatively nascent so the question of having considerable impacts on forest products trade (e.g. plantations for carbon sequestration) will impinge on if any of these markets will take off on a large scale.

Carbon offsets from forests have the best potential to become a globally traded environmental service. With regard to impacts on trade in forest products, reforestation and afforestation projects will expand the timber supply, mainly in tropical countries, and to a lesser extent, the energy cost effect will influence the location of processing industries. The available projections for demand of forest-based carbon credits in the first commitment period suggest that under specific circumstances carbon plantations could increase wood supply to the extent that it would affect timber price at regional level. The impacts will be first observed in Latin America followed by Asia. Africa would require special support to have access to carbon offset trade.

Forest plantations will be favoured, because during the first commitment period (2000-2012) one can credit only afforestation and reforestation projects. Further, non-Annex I countries do not have caps concerning emissions resulting from reductions in forest carbon stock. Such impacts may be exacerbated in the second and subsequent commitment periods by inter-annex leakage resulting from decreased timber harvests in industrialised countries. During the first commitment period this impact will be small.

The incremental impacts of other environmental service markets (biodiversity, landscape beauty, and watershed management) on wood supply and prices, and thus on international trade flows, are likely to be insignificant. However, local impacts can be important, including closing of production facilities because of reduced wood supply. The emerging markets for forest environmental services will offer an opportunity for low-income forest owners and managers to benefit economically from good husbandry or stewardship of their forest resources.

Additional revenue from environmental services will make SFM economically attractive in many locations but may not give a major boost for improved practices due to limited market sizes. Direct payment schemes for *forest biodiversity services*, including conservation concessions/easements and private conservation funding, are expected to have the most positive impacts on SFM in incremental terms.

Markets cannot develop and operate without government interventions. In fact, international environmental agreements/regulations have a strong potential to increase demand for services generated

by sustainable forest management. Markets and regulation are both needed; the question is about the balance between the two, and about the strengths and weaknesses of the market mechanism. Unless market creation for forest environmental services succeeds in generating more revenue than the total market costs, and this “profit” is channelled equitably to the land stewards, the incentives for SFM will not be created.

Trade and Markets –
Analysis of Dynamics, Trends and Determining Factors

Chapters and Sections:

- 3 Trade and Market Development in Forest Products and Services**
 - 3.1 Trade, Sustainability, Policy and Planning**
 - 3.2 Analysis of Trade Flows of Forest Products**
 - 3.3 Trade Restrictions for Forest-based Goods and Services**
 - 3.4 Market Development of Wood and Wood-based Products**
 - 3.5 Market Development for Environmental Services of Forests**

3 Trade and Market Development in Forest Products and Services

3.1 Trade, Sustainability, Policy and Planning

3.1.1 3.1.1 Forest Product Trade and Policies

When investigating the market developments, *ex post*, the trends and fluctuations are a net result from a large number of factors. The most important ones are related to the comparative advantage differences of industrial locations, and competitiveness differences of operators. Market access factors and variation in them are just one group of factors in the matrix.

Various forest products compete in the market place between each other, and against other substitute materials. A position of a sole supplier of a particular species and grade is rare, usually there is a sequence of substitute products. A supplier's competitive position depends on the characteristics of product, the cost of the domestic value chain and the whole range of international trade determinants. The market access barriers and impediments have a tendency of working through a twin bladed "scissors" effect: The direct effect comes from the hindrance of the barrier or impediment itself, the indirect effect comes from the cost competitiveness handicap. The extra cost is caused by the constraint itself, or an unsuccessful and costly effort to remove it.

Different policies may impact the market access directly or indirectly. Policies and measures can be divided in three types, according to how they influence trade and forestry:

- Trade policies and other measures that have direct impact on forest products trade, and thus indirectly impact the conditions of forestry
- Forest policies and other measures that have a direct impact on forestry, including sustainability of management, and thus indirectly impact the trade of products
- Policies and measures (such as land-use or development policies) which may have indirect impact on forestry, trade or one of these through the other.

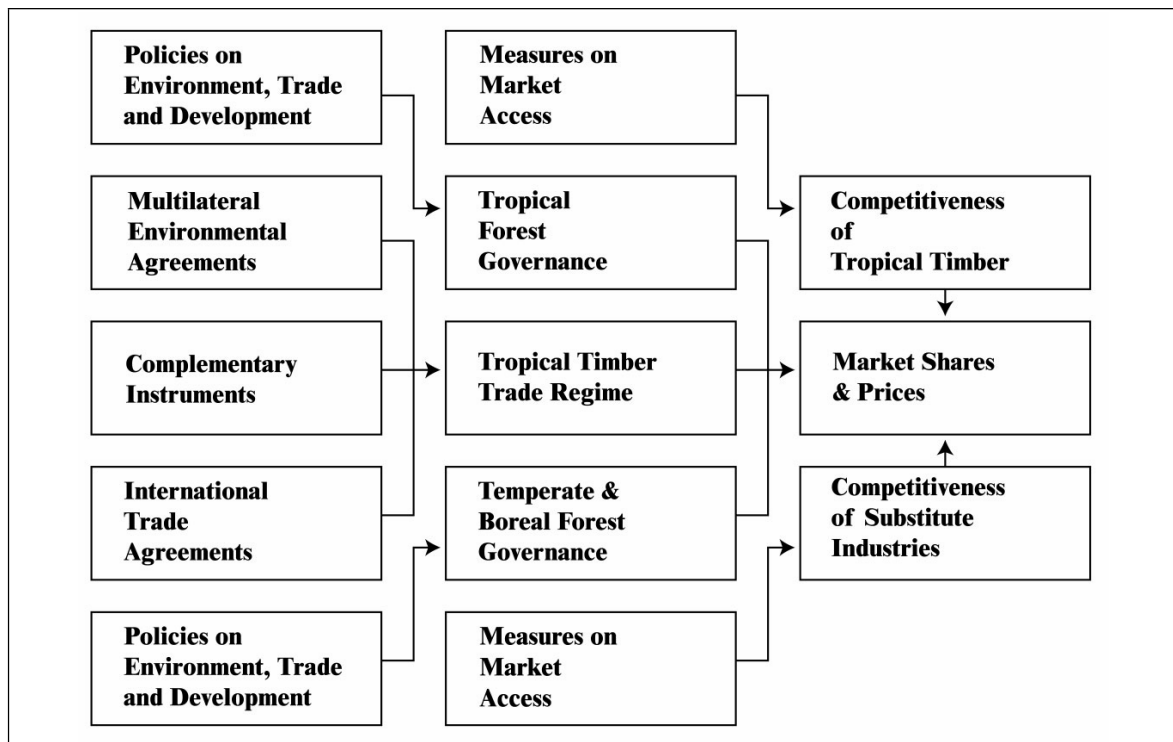
The commercial objective of the trade and industry is the net income and sufficient return to the invested capital. Processing generates value by adding further production factors, including labour. Value added means higher income generation from a given volume of wood. As described above, the value chain of forest products is mostly cost competitive and efficient. Unavoidable "dead weight" cost components, such as transportation and energy, cannot be eliminated or scaled down.

Looking at the positive side of the coin, in any market conditions, the savings from elimination of market access barriers or impediments feed directly to the net income. This is the incentive for the market stakeholders to work together for improved market access. Even the unavoidable cost components, such as logistic costs, which should be minimised, form important service industries in transportation and related functions.

Many policies or other measures have an influence on the relative cost competitiveness position of forest based enterprises. Any forest-based enterprise under the influence of such measures will be affected and its competitiveness will be changed in relation to other enterprises in the forest-based markets, domestic and foreign. In addition, any such cost competitiveness influence changes the relative position of the impacted forest based enterprises in relation to the competitors in other sectors.

If policy changes impact the relative cost competitiveness position of some of the forest based enterprises, this will be reflected in the trade flows. The pattern of trade flows will adapt to relative changes in the policies impacting their locations. Due to the complex nature of these interactions, it is not easy to describe the overall tendencies or structure of such changes. Figure 3.1 presents a schematic illustration of the wood product markets with policy interventions.

Figure 3.1 Trade, Sustainability, Policy and Planning.1 Market of Forest Products with Policy Instruments



3.1.2 3.1.2 Issues, which are Specific to Forest Products

Many of the generic market access factors, barriers and impediments, as well as measures have an effect on forest products as well as on other commodities, including the competitors and substitutes for wood. However, some factors have a tendency of having a stronger impact on wood products, or even a discriminating effect.

Box 3.1 Factors, which are specific to Forest Products

- Concern on deforestation and degradation
- Concern on lack of sustainability of forests
- Concern on inadequate forest management
- Concern on illegal forest operations and corruption
- Product standards written for local conditions
- Building codes and specifications, which have a tendency of favouring a small number of local dominant species and grades
- Public procurement rules which require specific positive proofs such as on “sustainability and legality”
- Rules explicitly and specifically excluding products from “rainforests”
- Certification schemes which have been tailored for local environments

International, regional and national environmental conditions, policies and regulations influence the market access and competitiveness of individual producers of forest products and thus affect trade flows. On the other hand, trade liberalisation and macroeconomic policy reforms have led to expanding exports by developing countries, particularly in commodities, thereby increasing pressure on the environment.

“Although Doha WTO Ministerial Conference brought a number of “new” issues onto the WTO agenda (investment, competition, *etc.*), market access remains one of the most important trading issues between the developing and developed countries. ...WTO members acknowledge the importance of enhanced market access for industrial products of interest to developing countries and agreed to start negotiations on the reduction or elimination of tariff peaks²⁶, high tariffs and tariff escalation, as well as non-tariff barriers on all industrial products.” (UNCTAD, 2003)

The markets of tropical timber cover a whole range of products, from logs to primary processed timber (sawnwood, veneer and plywood), and to secondary processed wood products (SPWP). The price levels vary widely, especially in the log markets, where the species and individual log quality have a wide value scale. Still, in primary processed tropical timber products, especially in sawnwood and veneer, there are marked differences by species and grade. The visual, strength and other characteristics are mostly dependent on the log quality, while skilful sawing, peeling, drying, and other processing eliminate most defects. In plywood, the process enhances the qualities even more, with the composite structure and the glue. At the same time, plywood becomes a much more standardised product. Finally, the SPWP category adds even more value by introducing process and design characteristics that bring additional value to the end-user.

The price structure of the whole range of the tropical timber products varies according to the inherent and added qualities described above. As always, the market clearance prices are a net result from the competitive process between a number of consumers and producers. Of course, market access barriers and impediments influence the market and price formation, and bias the otherwise competitive structure of the market. We describe the market structure in a somewhat simplified way. The purpose is to highlight well enough the features that have a bearing on the analysis of market access of tropical timber.

3.1.3 3.1.3 Value and Sustainability Issues in Forest Product Trade

Figure 3.2 illustrates conceptually the value structure of the forest product markets. Specific and detailed features, such as (exact) variation by species, and its implications are missing. However, attempt was made to keep the structural relations as correct as possible. The data for tropical timber in the year 2000 were used as a guideline. Thus, for example, the volume shares of various product categories are approximately true to the actual situation in the year 2000. The total volume of the whole range of tropical wood products was about 41.8 million m³ in 2000. In addition, the price relations between the averages by product category (logs, primary processed, and SPWP) are approximately true to the situation in the year 2000.²⁷

The figure 3.2 summarises some of the key issues, which link the trade with sustainable forest management (SFM). Included are main issues of value creation and trade-related matters. The figure is adapted from a report for ITTC (ITTO, 2003), and modified version in Rytkönen (2003). The figure illustrates the total market value created by the sub-sector. 1) On the left hand side are the log exports, 2) In the middle are the primary processed timber products, 3) On the right hand side are the secondary processed wood products (SPWP).

The most important policy issues are the following:

- The most critical policy issue is combating illegal logging (see left hand side of figure 3.2). These values are completely removed from the tax base if the enforcement cannot recover them through fines.
- The second most important policy issue is related to environment and local communities. This is illustrated in figure 3.2 on the lower left-hand side, and is called “environmental and social externalities”. These are costs that are incurred to as damage to the environment, in case no one is obliged to pay for them. In the same way, these include the lost values caused to the local communities by harvesting practices that destroy some of their traditional values. Compensation

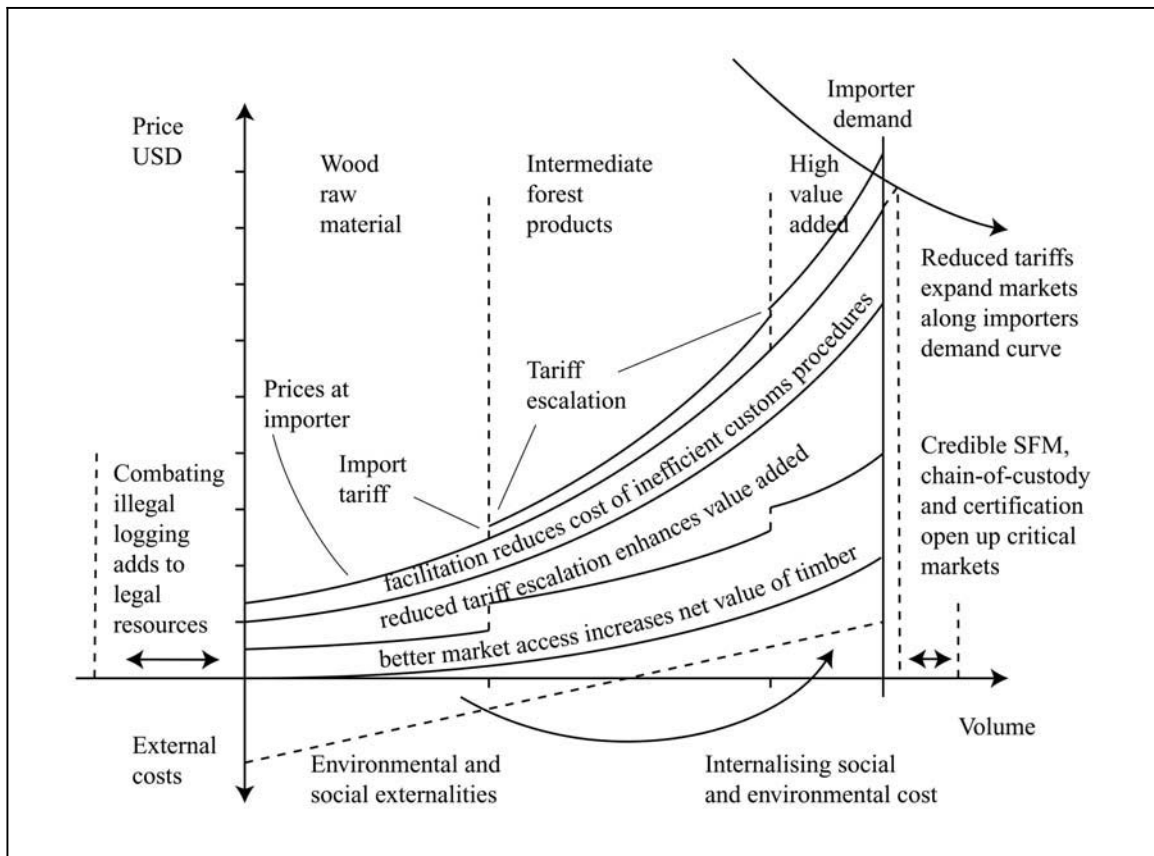
²⁶ A practice has developed to refer to tariff peaks as rates that are more than three times the national average.

²⁷ This abstraction fails to fully describe the intra-category richness of the products and their values, thus there are exceptions, especially in the very high valued end of each category.

for these damages is called “internalising environmental and social costs” on the lower right hand side of figure 3.2. Internalisation only occurs if the payments are actually made.

- The third important issue is the proposal to reach the target “niche” markets, which would possibly be willing to pay a price premium for the Mozambican high quality timber. The crucial term here is “quality” as such niche markets, for example in Europe, tend to consider legal, environmental and social issues as a part of the product quality. In effect these market increasingly require proof of “legality and sustainability”. Such proofs may need to be acquired through a third party verified SFM certification. This issue is illustrated as an expansion potential on the right hand side of the figure 3.2.
- The fourth issue is somewhat outside of forest policy domain, and concerns the increase of value added of production, i.e. movement of the timber volumes from left to right in the schematic picture of figure 3.2. It has often been found that it is ineffective to influence the industrial development from the forest resource side. However, competitive wood procurement, including tax incentives, may be a partial tool to promote value-added conversion (such as carpentry). Which process then provides increased employment and wider enterprise tax base.
- The fifth group of issues is concerned about market access, and is illustrated on top of the figure 3.2.

Figure 3.2 Value and Sustainability Issues in Forest Product Trade



Source: ITTO, 2003, Rytönen, 2003

To summarise, figure 3.2 deals with a number of policy issues that are related to value generation in the tropical forest sector. An optimal policy mix, including tax instruments would guarantee that the overall value (area under the curve in figure 3.2) is as high as possible. At the same time, it would attempt to minimise the harmful effects that affect these values negatively. If the policies are successful, this will provide a wide economic base and thus the basis to generate high economic value, including a high government rent capture.

Figure 3.2 represents the total value of tropical timber products at the importers. The topmost curve represents the array of import prices, valued with cost, insurance, freight (CIF) included, at various entry ports in importing countries. The total area below the price (CIF) curve represents the total import value of the tropical timber imports in all markets. The second curve from top represents the corresponding export price array. The export prices are at exit ports, valued at free on board (FOB) of carrier. The difference between CIF and FOB prices reflects all the cost components, between the two ports, related to the international transaction and logistics.

Figure 3.2 further illustrates decomposition of the export value of tropical timber into three components. The decomposition is not exact but should represent the approximate importance and relative shares of the components. The decomposition has here been made from the point of view of sub-sector value added components. Starting from bottom, the basis for commercial operations is laid in the forest operations. The costs of harvesting and transport are easily linked to any particular log harvest. However, the cost of forest management is already a somewhat more difficult item. The specific difficulties are related to the long time span and geographic distribution of forest management operations. In addition, it is not always clear what items should be included (if *e.g.* road construction, planning, monitoring, bio-diversity protection, reforestation, *etc.* should be covered). If a narrow concept of forest management were applied in costing, the sustainability of the resource base would be at risk.

In Figure 3.2 there are two more cost items: net resource value and value added by processing. If the harvesting and transportation costs are high, as a consequence the net resource value accruing to the forest owner remains low.²⁸

The net resource value illustration of includes the effect of further processing. As the illustration is on output volume basis, the price should cover the cost of the whole log input, according to yields of various processes. Consequently, primary and secondary processing need to cover higher resource value per unit of output. The resulting stepped curve between net source value and value added reflects the relative income shares of tropical logs on one hand and other factors of production (capital, labour and energy) on the other. It is important to note that it is often the net resource value, accruing to forest owners, which has the highest pressure to adjust when, for example, the market conditions deteriorate.

The market access of forest products may become threatened from several directions. This situation is illustrated in figure 3.2. The classic case is the import tariffs stipulated by the importing nations. These have commonly been reduced, and logs are often entering without tariffs. But tariffs still prevail for higher value added, *i.e.* further processed tropical wood products. This tariff escalation functions as a hindrance for producer development effort to add value to production. The local importer in the consumer country now faces a higher price, and is forced to consider alternative sources. The alternative sources may include an exporter with preferential treatment from where the imports have lower tariffs. In the worst case the purchase decision is made in favour of local timber or substitute material.

Market access effects from the supply side of the tropical timber trade are somewhat indirect but are becoming more important. One issue is illegal operations in forest and trade. Firstly, the illegal operations affect negatively the long-term sustainability of forestry. In terms of the market, the illegally harvested timber adds to the cost of overall operations in several ways. The stolen timber volume often enters the legal market and may thus have a negative effect on price formation. On the other hand, it may get smuggled out of the country and thus not be available for value added processing. Secondly, it does not contribute to the management, rent capture (concession fee or stumpage income) or fiscal base.

Illegal timber enters the non-transparent grey market, and the illegal operations are irresponsible for many of the SFM cost items. As a result, there is a tendency to be offering timber for below the cost of legal operations. This illegal supply is likely to have a leveraged downward pressure on prices, which harms the overall market, from the legal producers' point of view in the short run, and from the global point of view in the longer run.

The issue of cost internalisation is a broad one. The assessment of the environmental and social costs is complicated due to qualitative nature of many effects and the long run and global perspectives to the

²⁸ The most distant operations in difficult conditions, may justify higher costs. Usually then the sales prices reflect this. As explained above, the present illustration can not fully account for variation for species, neither can it cover location specifics.

accrual of the benefits and costs. Without the full cost internalisation, the market does not fully reflect the environmental and social costs. In such a situation, the output, which is based on unsustainable practices, may appear too attractive (low cost) than products based on SFM. Figure 3.2 summarises the economic effect of market access improvement.

Figure 3.2 illustrates some of the main measures to reduce the effects of constraints to open markets, and the types of effects that these measures are likely to have. Further reduction in tariffs, and lowering of the steep tariff escalation, reduce the effective price level at the consumer country importer of tropical timber. Lowered prices increase the probability of a positive purchase decision. Especially if the measure has been discriminatory in relation to key competitors, the elasticity of the purchase response may be very high (*i.e.* 1% price reduction would result in an increase of more than 1% in volume).

The second group of measures with somewhat similar effects compared to tariff reduction, is related to inefficient in-border procedures. The inefficient border procedures increase the transaction costs unnecessarily. Various studies have estimated the cost of inefficient border procedures to cost anywhere between 2-15% of the value of trade but these estimates are not specific to tropical timber. Kleitz (2002) warns against generalising the results of such studies, but some studies estimate that the total transaction costs are in the range of 7-10% of trade value.

The benefits of trade facilitation have been found to be at about 1-5% of the total world trade value. Even if the trade of tropical timber would already be one of the most efficient ones compared to the above range of estimates, it is still likely that savings of one percentage point or more of the trade value could be possible from improvement of the efficiency of cross-border transactions. In other words the savings in transaction costs could be around 10%.

The success rate in combating illegal logging relates directly to the resource base, which can be put under SFM and to the use in which it is meant to be according to the land-use plan. This will increase the legal resource base, add to the allowable legal harvesting volume and bring operations to a wider fiscal base. The actual net loss from both economic and environmental point of view is in a successful case converted to a net gain. The consumer countries are increasingly searching sources for “legal and sustainable wood procurement”. By building evidence for such successful action can again have a leveraged effect on a wider resource base (*e.g.* national level reputation).

Internalisation of environmental and social costs increases local welfare as well as local and global environmental services. Internalisation of the costs would be a prerequisite, a necessary but not a sufficient condition, for implementing a funding mechanism for sustainable practices. Often measures to implement climatic, bio-diversity and social goals are mutually supportive. Improved performance in terms of SFM is important especially from the point of view of the markets with most critical attitudes towards “sustainability and legality” of the tropical wood sources. Some of these markets have formalised market access criteria of tropical timber. To enter such markets, evidence is required on the performance. Certification of origin and a validated chain-of-custody (CoC) contribute towards this goal. SFM certification at a high level of standard could be further contributing to the credibility of the source.

3.1.4 3.1.4 Forest Sector Planning and Trade Issues

Policy issues and trade were discussed in the previous sections (3.1.1-3.1.3). The treatment has been quite “market driven”, and the trade in forest products has been the starting point. In the previous section on “value and sustainability” there was already a strong link to forest management sustainability issues.

Even if the starting point was the global forest products market, the other logical end of the continuum is the forest resource base. In this study project it has been concluded that the influences are bi-directional, both from the trade to the forests, and from the forests to the markets. However, the relationship is far from symmetric.

In a competitive, open, and fully market driven system, the demand and supply would be able to balance through time, allowing sustainable development of economies, markets and forests. However, there are market failures and other reasons why the balancing through time is far from perfect. Trade policies and other general policies were discussed above. They have their role to play in the attempt to correct the market failures.

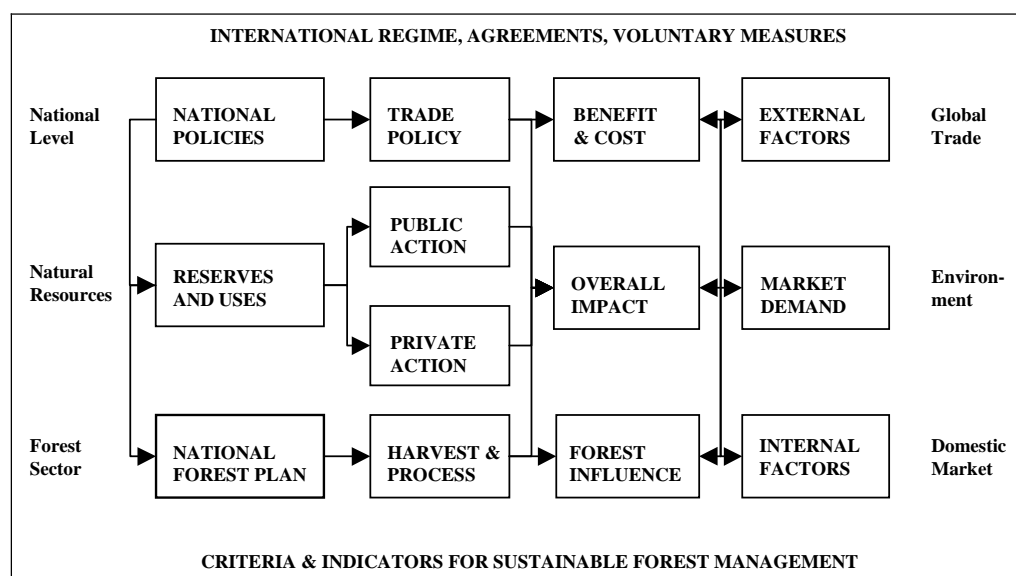
It is often concluded that in addition to general policies (such as trade policies and natural resource conservation policies), sector specific measures are needed to avoid worst impacts and to promote positive outcomes such as sustainability. One reason is the typically short planning horizon, and strong preference for the immediate future, of the private operators in the forest product market place. Failures of some of these operators to pay for the true cost of their forest-based inputs, aggravates the situation. Illegality and externality as illustrated in figure 1.2 are among these issues.

Figure 3.3 illustrates the role of national level forestry planning in the overall framework of market and policy issues. General national policies, including the trade policy, can seldom make special arrangements for forest sector only. The other natural resource-related policies often need to be more specific on forests, due to their relative importance as a resource and as a part of the environment. Private action as well as public activities are sometimes in conflict with forest related policies.

Market factors and other internal and external factors, including market failures and policy failures, may cause negative influences on forests. Explicit forest policies and sector strategies exist in almost all countries. National forest plans are common as well, varying in their status, depending on the degree of market orientation, versus central planning, in the country. Most often, some form of National Forest Plan is felt necessary, to compensate for negative influences and short-sighted tendencies of users of forest-based services.

National forest sector planning, which is based on explicit forest policy and long term strategy, typically builds in the principles of sustainable forest management (SFM) and can use the criteria and indicators (C&I) for SFM in measuring the achievement towards positive planning targets.

Figure 3.3 Sector Planning for Sustainability, and Trade Issues



3.1.5 Conclusions

Trade is beneficial to development, and to SFM, if governance conditions are in place. Some economies still use protective measures, including barriers to trade. Some of these measures may be a partial remedy to structural problems. The governance conditions will be put to a historical test in a case where trade liberalisation is implemented. The danger is that the governance fails to guide a nation through the pressures of an opening international market. This is often the case, especially in developing economies. In the long run, further liberalisation of trade with domestic structural changes, can move the global and local economies towards higher welfare, simultaneously with better, sustained forest management.

A large range of potential policies and measures exist to improve the market access of forest products. The quantitative effects of the improved market access efforts are on several fronts:

- Reduced tariffs, and less steep tariff escalation, reduce import prices and thus expand the markets along the consumers' demand curve
- Trade facilitation reduces the cost of customs procedures and other border transactions. The net effect from these is similar to tariff reductions. The product appears more economical for the importer, who is likely to increase purchases
- The final result from tariff reduction and facilitation potentially enhances the net resource value of the tropical timber resource
- Successful combating of illegal forest practices can bring a larger resource base under legal and effective environmental and forest management. This increases to the volume of supplies, adds to the net resource value, and contributes to a wider fiscal base
- Internalising the environmental and social externalities increases welfare and the level of local and global environmental services. This does not come without cost, but does increase the overall cost level of resource management
- Forest sector planning can be an effective tool in compensating for some of the negative influences from market failures and policy failures. Planning, which is based on explicit forest policy and long term strategy, typically builds in the SFM principles and can use the C&I for SFM in measuring the achievement towards positive planning targets.
- Evidence of SFM improves the credibility and trust of the importers, opening up some critical markets, and thus increasing demand for tropical timber.

3.2 Overview of Trade Flows of Forest Products

3.1.6 3.2.1 World-wide Trade Dynamics in Roundwood, Sawnwood, and Wood-based Products

Figure 3.4 illustrates the global export supply of industrial wood raw materials on a cumulative scale. More than 215 million cubic meters of wood raw material was supplied to the international markets in the year 2000. A wide variety of species served a wide variety of needs in various processes. While it is likely that some of the high valued species are capable of maintaining their markets, and possibly even fetching increasing prices, the main tendency seems to be towards commodity grades. The fast growing plantations grown chips are likely to be increasing their share of the market.

Figure 3.4 Export Supply of Total Industrial Wood Raw Material in 2000

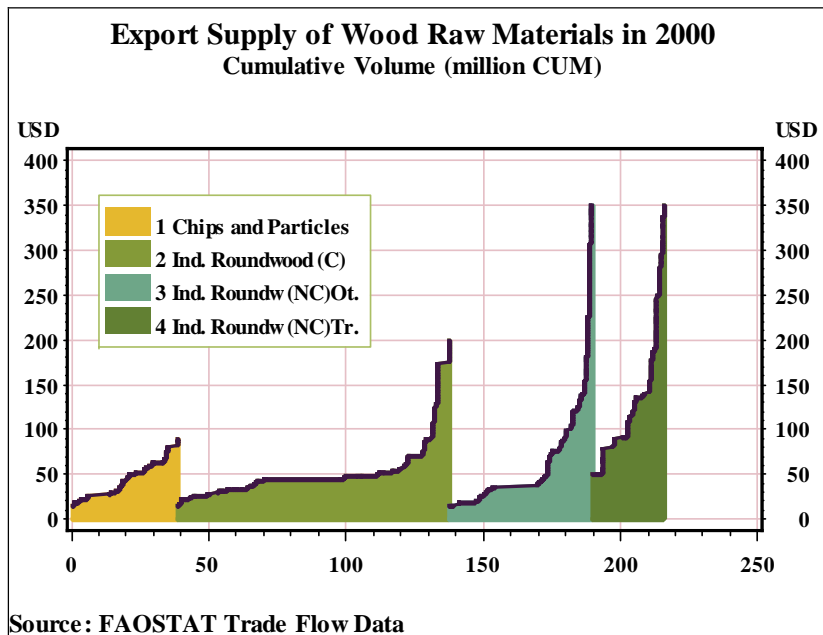
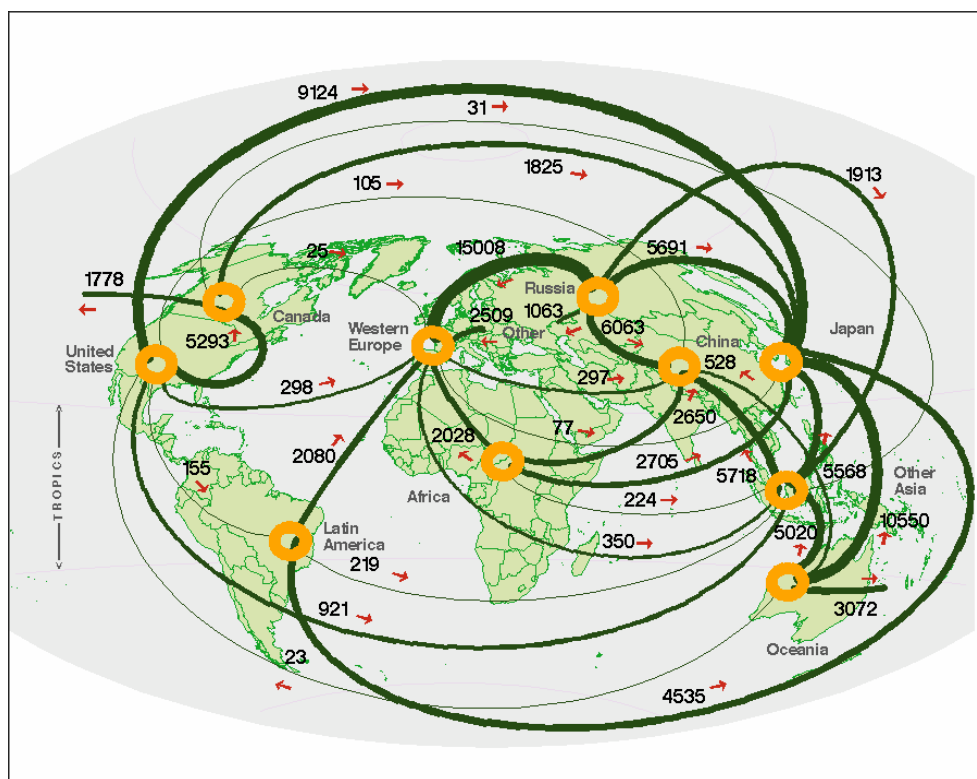


Figure 3.5 presents a map of the interregional net trade flows of wood raw materials. To specify this more carefully: Intra-regional trade flows are not counted here (such as trade between European Union countries). As most often there exists some cross-haulage of the same commodity between two large regions, this is eliminated as well. This means that if there is exports of wood raw material from USA to Europe, and from Europe to USA as well, the smaller flow is deducted from the larger one. The remaining flow represents the inter-regional net trade volume.

Figure 3.5 Main Net Trade Flows of Wood Raw Materials in 2000 (in 1000 cum)



Source: FAOSTAT Trade Flow Data

Table 3.1 Inter-Regional Trade of Wood Raw Material in 2000 (million cum)

EXPORTER	RUS	OCE	AFR	USA	LAC	CAN	OTH	EUR	ASI	CHN	JPN	XXX	TOTAL
IMPORTER													IMPORTS
Russia													0.000
Oceania													0.000
Africa	0.017	0.001											0.018
USA	0.005	0.023	0.001										0.029
L.Am. & Car.			-0.187	0.155									-0.032
Canada			0.002	5.293	0.001								5.296
Others	1.063	-0.185	0.667	0.371	-0.066	1.773							3.623
Europe	15.008	0.030	2.028	0.298	2.080	0.025	5.691						25.160
Asia, other	1.913	5.020	0.224	0.921	0.219	0.031	0.211	0.350					8.889
China	6.063	0.528	2.650	0.105	0.021	0.043	1.344	0.297	5.718				16.769
Japan	5.691	10.550	2.705	9.124	4.535	1.825	-0.286	0.077	5.568	1.476			41.265
Unspecified	0.135	3.257	-0.035	0.276	0.089	0.005	0.001	3.182	0.309	0.806	-0.022		8.003
TOTAL													
EXPORTS	29.895	19.224	8.055	16.543	6.879	3.702	6.961	3.906	11.595	2.282	-0.022	0.000	109.020

Source: FAOSTAT Trade Flow Data

Quite similarly to the overall net trade pattern of the forest products in total (see figure 1.1), one can observe that main flows are from west to east. However, there is an important counter-current from Russia to Western Europe. In the case of roundwood, there are quite important flows from south to north as well. The dominant position of Japan as the largest import market can be seen as a strong hub. But China, too has been increasing its import demand in recent years.

Table 3.1 carries the same information as figure 3.5, with more detailed information on individual flows. All net flows between regions are reported in the table.

[Annex table A3-3 covers all the trade in wood raw material, including the intra-regional trade and bi-directional trade flows between any of the reporting regions. Annex table A3-4 analyses the composition of the global wood raw material trade. The total trade is divided into the following components:

- Gross imports (total of the following components)
 - Intra-region imports
 - Inter-region cross haul
 - Inter-region imports
- Net exports

From table A3-4 one can conclude that of the total volume of 165 million cubic metre, about 45 million cubic meters were intra-regional trade.]

Figure 3.6 Development of Real Export Price of Roundwood, 1980-2002

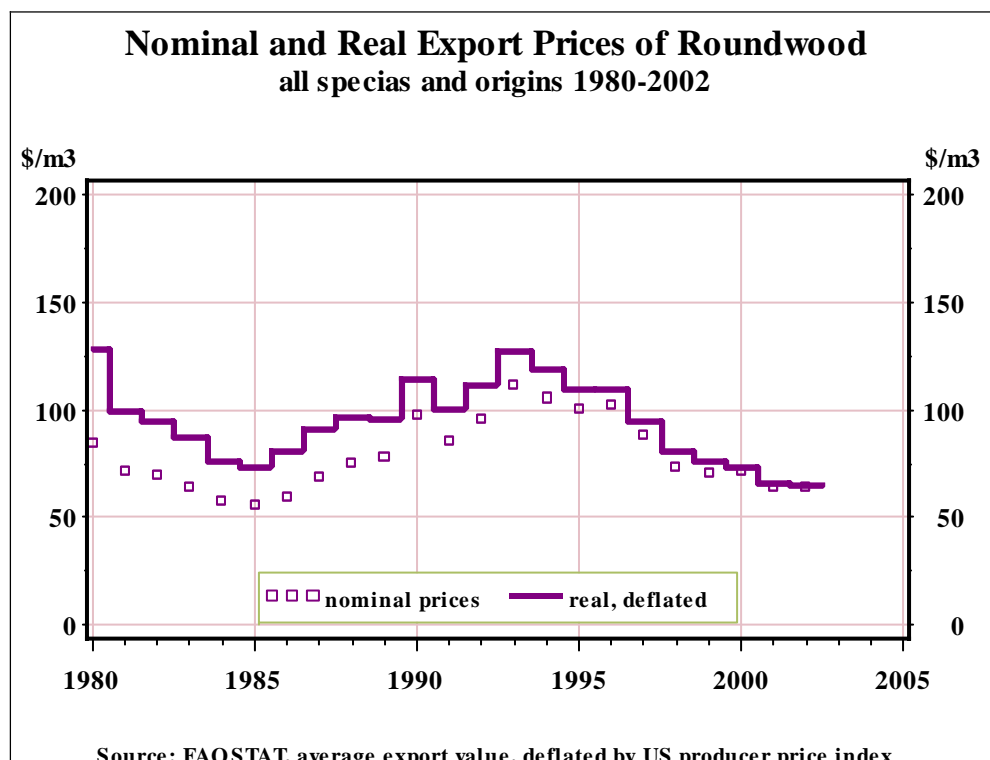


Figure 3-6 illustrates the development of roundwood prices in the past 23 years. The strong cyclicity is visible in the price series. In addition, one can conclude that a downward trend seems to be present. The nominal prices as such do not reveal this. However, deflation of the price series (by US producer price index) reveals a slight decrease in the overall prices. There has been a rather strong downward movement since the year 1993.

Figure 3-7 illustrates the development of the real export unit prices of roundwood, now separately for tropical and other origins. The tropical roundwoods have had a strong nominal upward trend (which is still visible in the real deflated prices). Instead, the non-tropical prices are heading down. Overall, the relative

scarcity of tropical logs is visible here. Part of the reason is the tropical countries' policies to restrict raw material exports. The expansion of non-tropical roundwood has taken place with a decreasing price trend. One result from the differing trends of roundwood, by origin, is a decreasing trend in the competitiveness of tropical roundwood in the global markets. A further consequence is a decreasing potential for financing of SFM from wood raw material sales.

Figure 3.7 Development of Price of Roundwood by Origin, 1980-2002

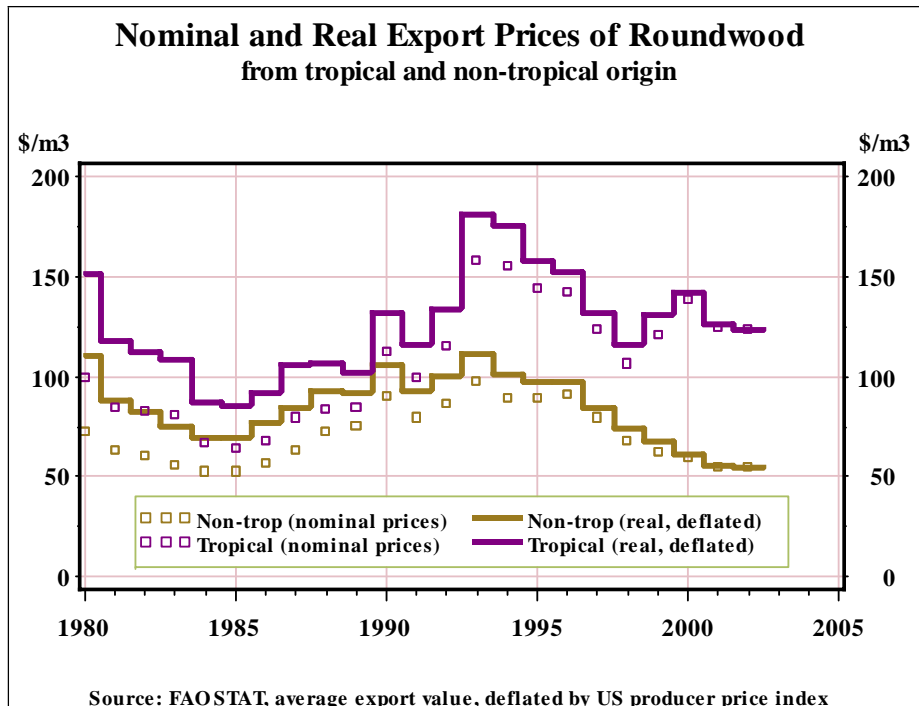


Figure 3.8 illustrates how the tropical roundwood has been losing market share in the global markets.

Figure 3.8 Share of Tropical Roundwood in Global Trade, 1980-2002

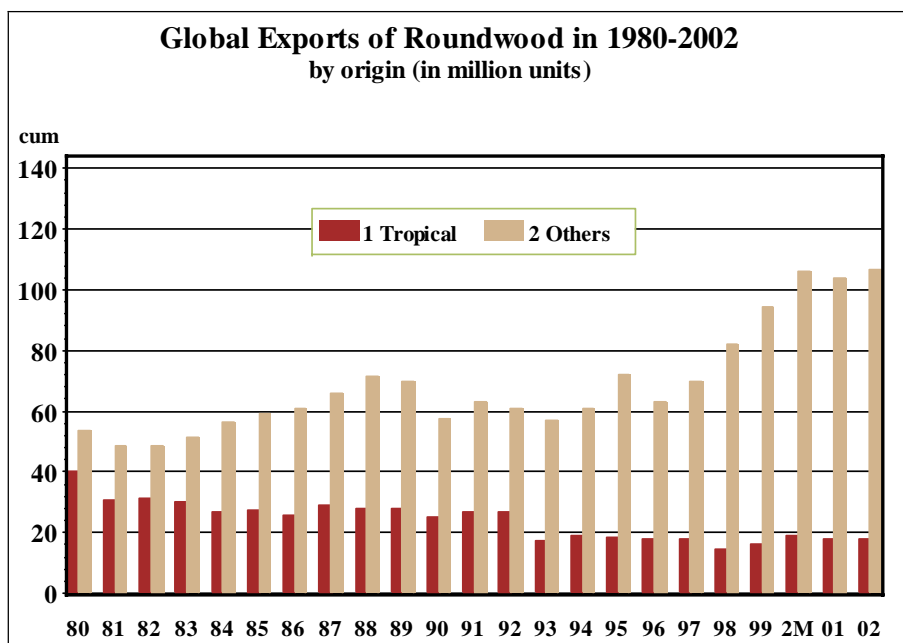


Figure 3.9 illustrates both softwood and hardwood supplies in the same frame, for comparison. The predominantly commodity grades of softwood on the left-hand side, and the more specialised hardwoods on the right-hand side.

Figure 3.10 shows a map illustrating the global directions of interregional net trade volumes of sawn softwoods in the year 2000. The strong dominance of Canada, as by far the main player in the global sawnwood markets, is clearly visible. Main flows are towards east. However, counter currents are several: From Russia to west, from Oceania to west, and even Europe and Latin America as net exporters to USA.

Table 3.2 covers all the net trade flows between regions. [Annex tables A3-5 and A3-6 report total inter-regional gross trade flows, and the composition of gross trade into its components, respectively.]

Figure 3.9 Export Supply of Total Sawnwood by Species Group in 2000

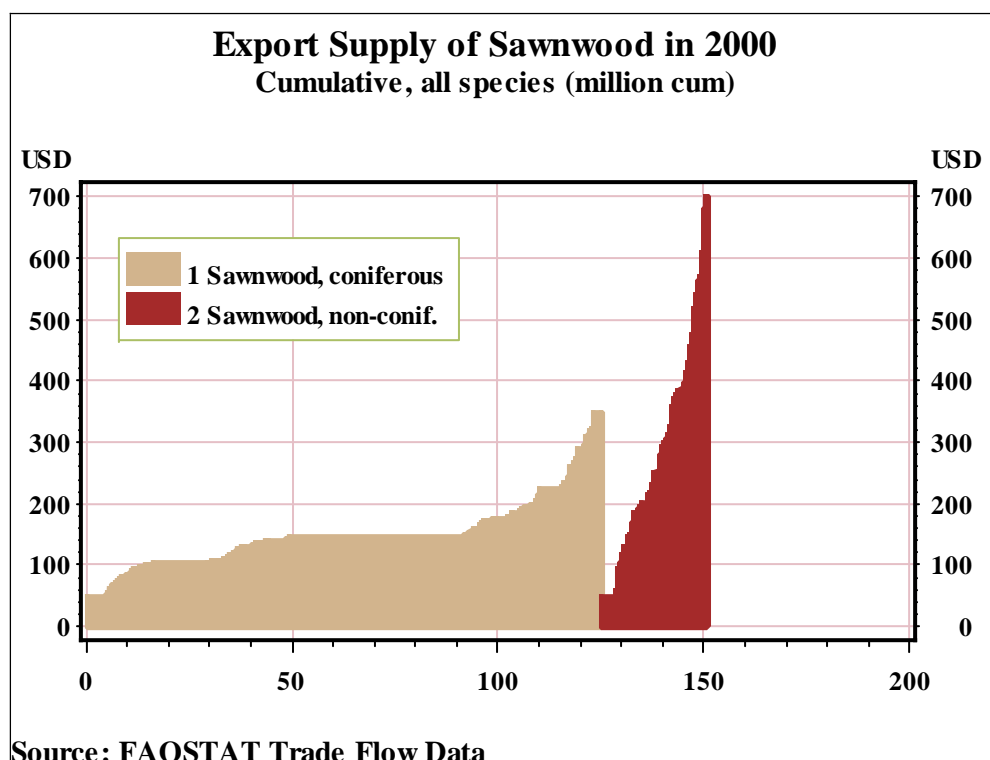


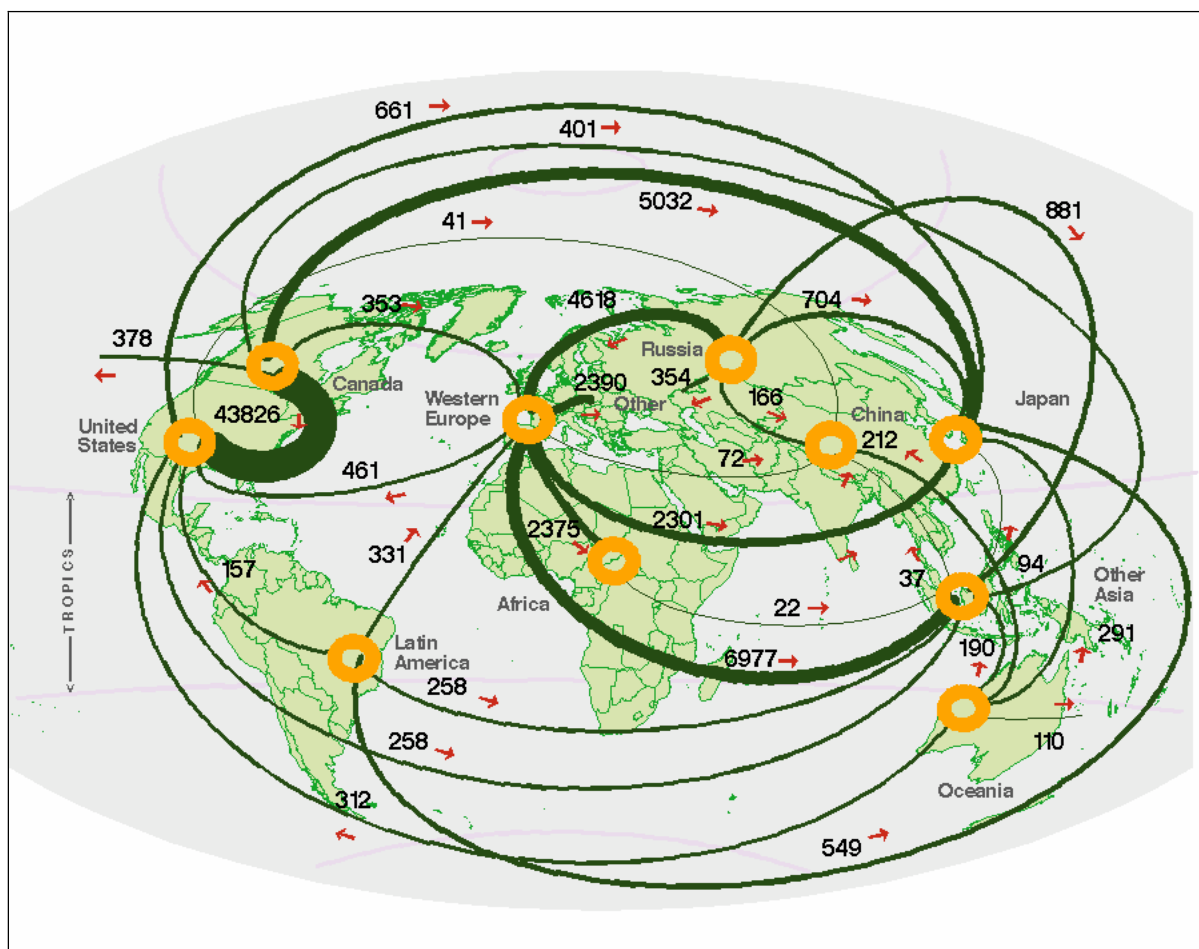
Figure 3.11 illustrates the global net trade flows between regions for sawn hardwood. The pattern is quite different from the sawn softwood trade. In sawn hardwoods there are very major flows from the south to north. The very largest single flow is from “Other Asia” to China. Table 3.3 reports on all inter-regional trade flows of sawn hardwood.

[Additional information covering gross trade flows of sawn hardwood is in annex table A3-7 and A3-8, the latter reporting on the composition of the total gross trade.]

Figure 3.12 illustrates the real price development of total sawnwood exports, on average. The tropical sawnwood has experienced a quite volatile price history in the past 23 years. The real price seems trend-wise quite stable.

[Annex 4 includes further information on price developments. Figure A4-4 reveals marked differences in sawnwood prices to different destinations.]

Figure 3.10 Main Net Trade Flows of Sawn Softwood in 2000 (in 1000 cum)



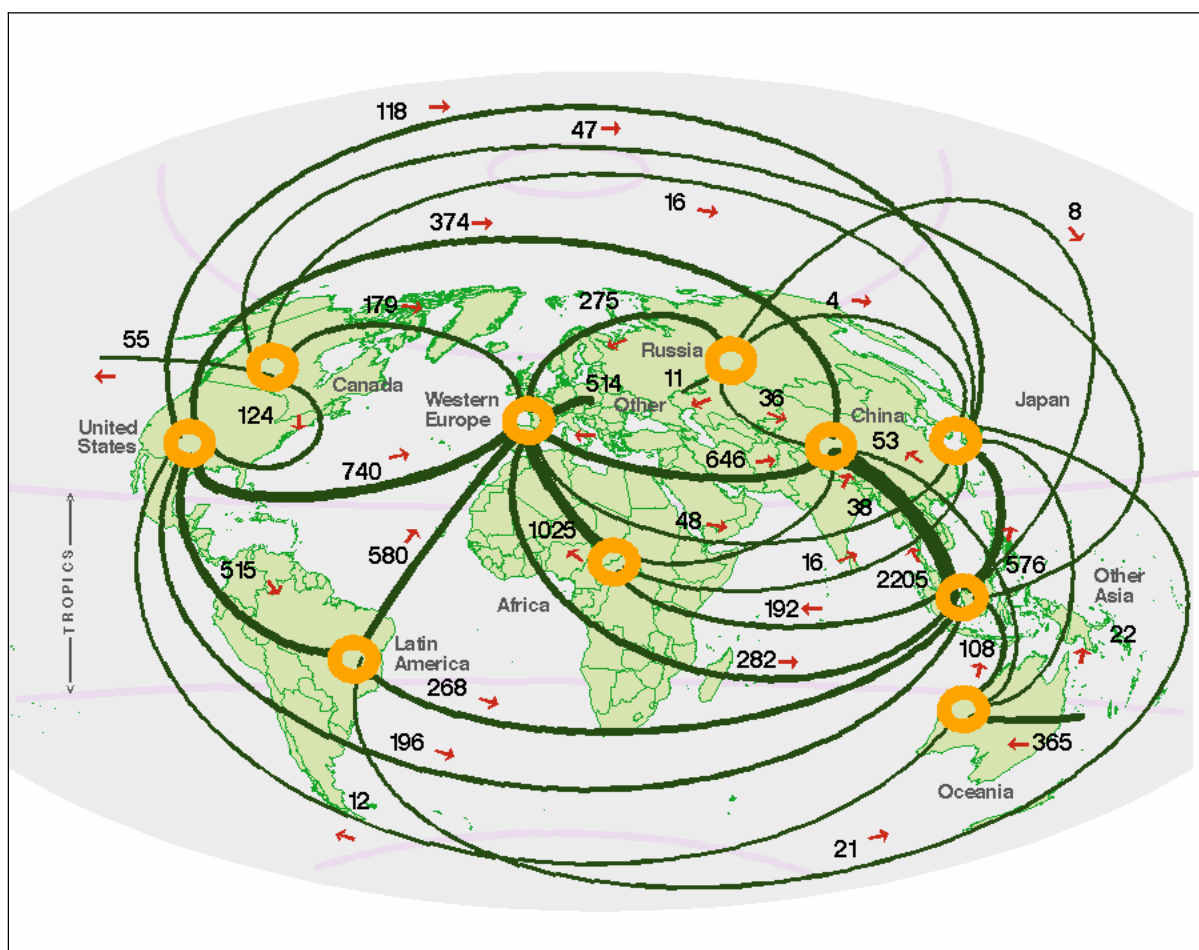
Source: FAOSTAT Trade Flow Data

Table 3.2 Inter-Regional Trade of Sawn Softwood in 2000 (million cum)

EXPORTER	RUS	CAN	EUR	LAC	OCE	OTH	USA	AFR	ASI	CHN	JPN	XXX	TOTAL
IMPORTER													IMPORTS
Russia													0.000
Canada	0.002												0.002
Europe	4.618	0.353											4.971
L.Am. & Car.	0.004	0.044	-0.331										-0.283
Oceania	0.001	0.305	0.084	0.001									0.391
Others	0.094	0.110	0.588	0.422	0.109								1.323
USA	0.028	43.826	0.461	0.157	0.312	-2.113							42.671
Africa	0.878	0.006	2.375	0.146		-0.150	0.003						3.259
Asia, other	0.881	0.401	6.977	0.258	0.190	0.048	0.258	0.022					9.035
China	0.166	0.141	0.072	0.042	0.212	0.169	0.041		0.037				0.879
Japan	0.704	5.032	2.301	0.549	0.291	-0.454	0.661		0.094	0.078			9.256
Unspecified	0.260	0.268	1.802	0.226	0.001	0.003	0.079	-0.001	-0.013	-0.002	-0.118		2.506
TOTAL													
EXPORTS	7.637	50.485	14.328	1.802	1.115	-2.497	1.042	0.021	0.118	0.076	-0.118	0.000	74.010

Source: FAOSTAT Trade Flow Data

Figure 3.11 Main Net Trade Flows of Sawn Hardwood in 2000 (in 1000 cum)



Source: FAOSTAT Trade Flow Data

Table 3.3 Inter-Regional Trade of Sawn Hardwood in 2000 (million cum)

EXPORTER	LAC	CAN	USA	AFR	OCE	OTH	RUS	ASI	EUR	CHN	JPN	XXX	TOTAL
IMPORTER													IMPORTS
L.Am. & Car.													0.000
Canada	0.018												0.018
USA	-0.515	0.124											-0.391
Africa	0.005	0.006	0.004										0.015
Oceania	0.003	0.001	0.012	0.112									0.128
Others	0.251	0.004	-0.001	-0.412	-0.371								-0.529
Russia			-0.001			0.075							0.074
Asia, other	0.154	0.047	0.196	0.192	0.108	0.754	0.008						1.459
Europe	0.580	0.179	0.740	1.025	0.006	0.905	0.275	0.282					3.992
China	0.114	0.123	0.374	0.038	0.053	0.166	0.036	2.205	0.646				3.755
Japan	0.021	0.016	0.118	0.016	0.022		0.004	0.576	0.048	0.286			1.107
Unspecified	0.065	0.008	0.226	0.110	0.006	0.001	0.003	0.248	0.391	0.130			1.188
TOTAL													
EXPORTS	0.696	0.508	1.668	1.081	-0.176	1.901	0.326	3.311	1.085	0.416	0.000	0.000	10.816

Source: FAOSTAT Trade Flow Data

Figure 3.12 Development of Real Export Price of Sawnwood, 1980-2002

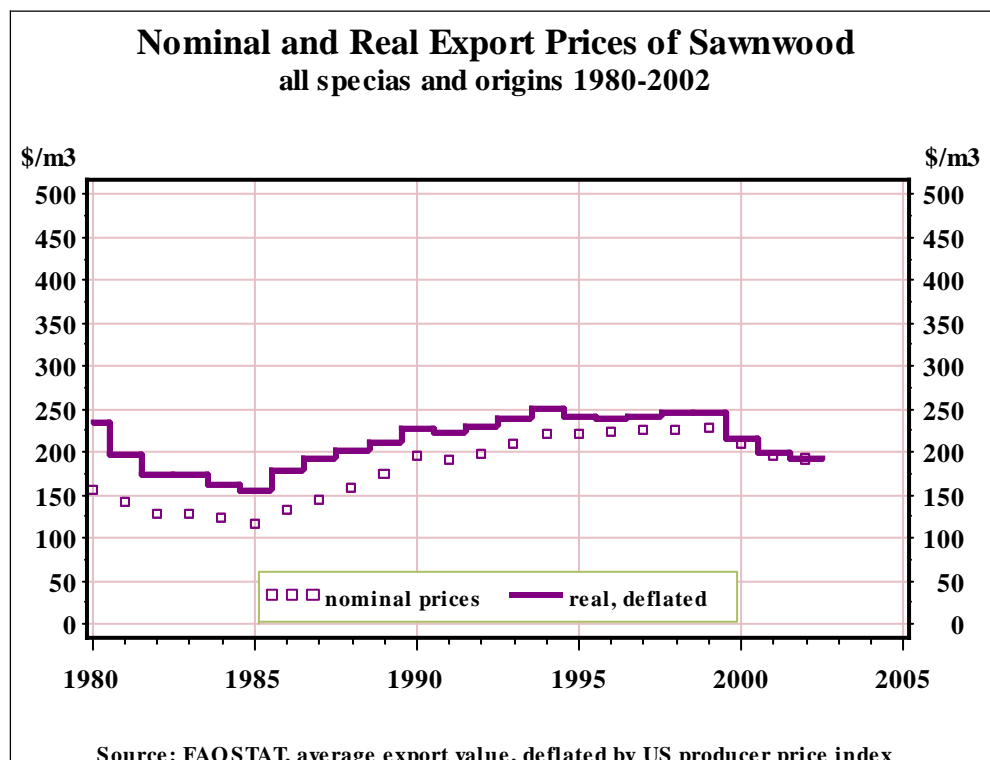


Figure 3.13 illustrates the overall shift in the global export supply of sawnwood. The total export supply has expanded quite fast, by almost 50% in the last 22 years. At the same time, the real price has been slightly reduced. Actually, the price reduction is one of the reasons of being able to expand the sales volume. The negative part, from the sellers' point of view, has been that the average sales value has not grown as fast as the volume.

Figure 3.13 Shift in Global Export Supply of Sawnwood, 1980 to 2002

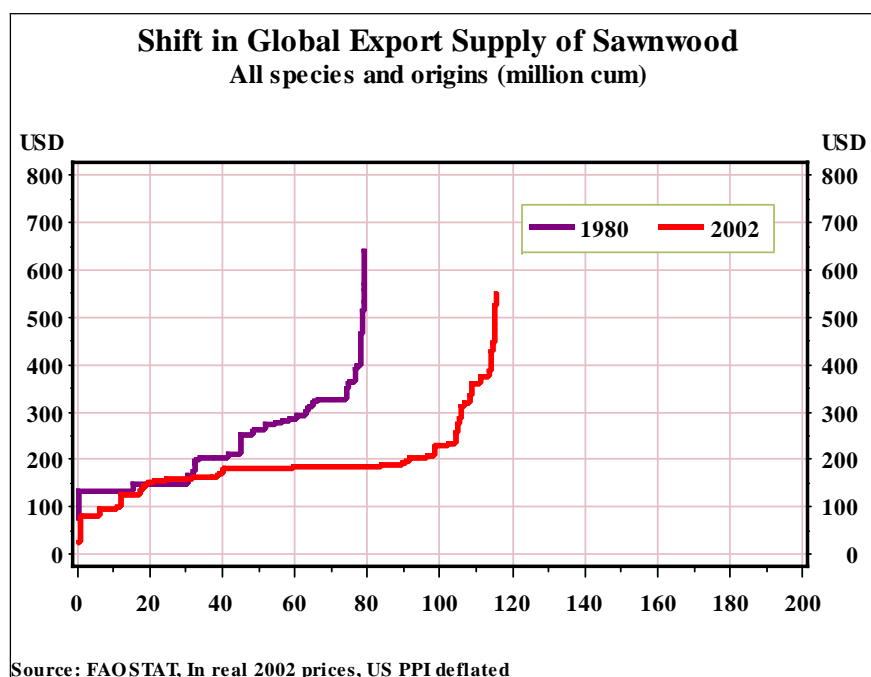
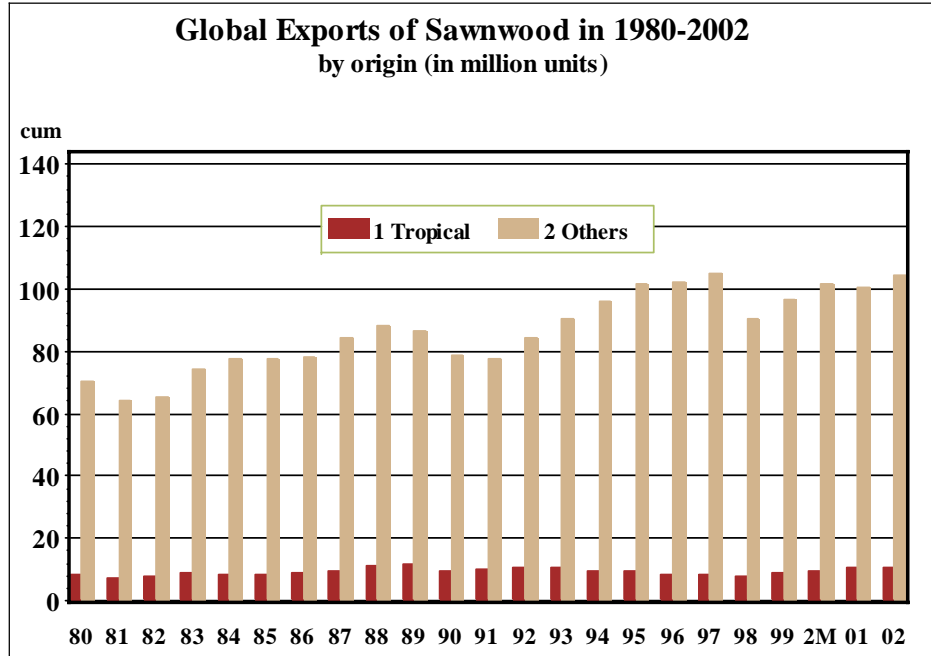


Figure 3.14 illustrates the relative market share performance of tropical and other sawnwood, indicating that tropical volumes have grown only little, while non-tropical sawnwood has expanded internationally.

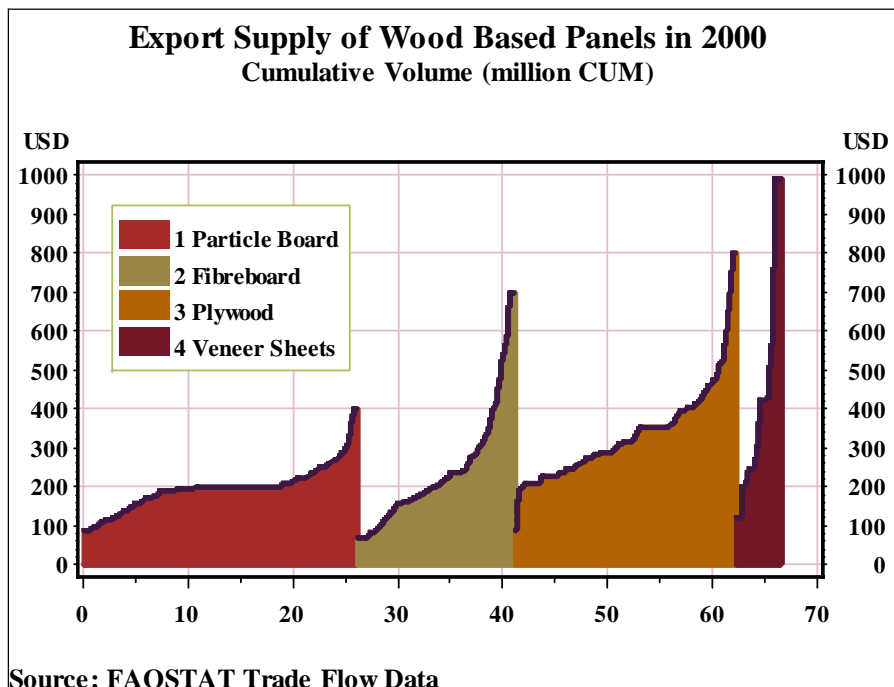
Figure 3.14 Share of Tropical Sawnwood in Global Trade, 1980-2002



Source: FAOSTAT

Figure 3.15 presents the cumulative global export supply of all of the wood based panels, from the most commodity type particleboard to the most specialised veneer sheets. The aggregate global export supply volume was about 67 million cubic meters in the year 2000.

Figure 3.15 Export Supply of Total Wood Based Panels in 2000

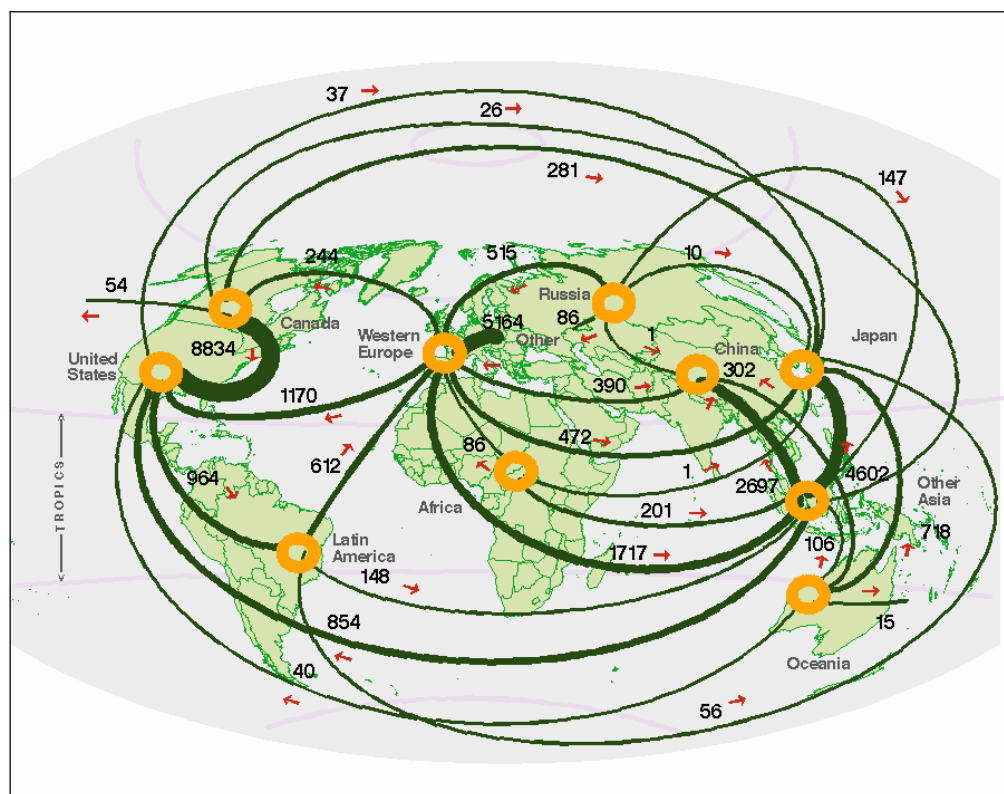


Source: FAOSTAT Trade Flow Data

Figure 3.16 presents a map, which illustrates the main net trade flows of all wood based panels, combined. Asia is very strong in panel volumes, with Japan as main importer and China as second. Europe is both a strong importer (from east) and exporter to west. Table 3.4 describes all the inter-regional net trade flows.

[Gross trade flows can be found in Annex table A3-9, and Annex table A3-10 presents the composition of the gross trade into components.]

Figure 3.16 Main Net Trade Flows of Wood Based Panels in 2000 (in 1000 cum)



Source: FAOSTAT Trade Flow Data

Table 3.4 Inter-Regional Trade of Wood Based Panels in 2000 (million cum)

EXPORTER	LAC	RUS	EUR	AFR	CAN	OCE	ASI	CHN	OTH	USA	JPN	XXX	TOTAL
IMPORTER													IMPORTS
L.Am. & Car.													0.000
Russia	0.001												0.001
Europe	0.612	0.515											1.127
Africa	0.026	0.099	-0.086										0.039
Canada	0.002	0.009	0.244	0.014									0.269
Oceania	0.005	-0.003		0.002	0.002								0.006
Asia	0.148	0.147	1.717	-0.201	0.026	0.106							1.943
China	-0.019	0.001	0.390	-0.007	0.035	0.302	2.697						3.399
Others	1.443	0.089	5.302	0.095	0.087	0.016	0.271	-1.380					5.923
USA	-0.964	0.288	1.170	0.067	8.834	0.040	0.854	0.016	-0.119				10.186
Japan	0.056	0.010	0.472	0.001	0.281	0.718	4.602	0.133	-0.524	0.037			5.786
Unspecified	0.284	-0.003	-0.138	0.020	-0.033	-0.001	-0.039	0.990	-0.033	0.010	-0.070		0.987
TOTAL EXPORTS	1.594	1.152	9.071	-0.009	9.232	1.181	8.385	-0.241	-0.676	0.047	-0.070	0.000	29.666

Source: FAOSTAT Trade Flow Data

Figure 3.17 illustrates the evolution of the real prices of the wood based panels. The strong downward trend is easily observed. The basic driving force has been strong investment activity in large facilities with modern technology. Actually both MDF and OSB have improved the process and competitiveness of these product groups. The efficiency of the processes with ability to use low cost wood raw material, has resulted in competitive market with reductions in prices, and consequently, expanding markets.

[Figure A7-12 of annex 7 divides the prices into two components by tropical or non-tropical origin, however, the price differences are small, at least on the aggregate.]

Figure 3.17 Development of Real Export Price of Wood Panels, 1980-2002

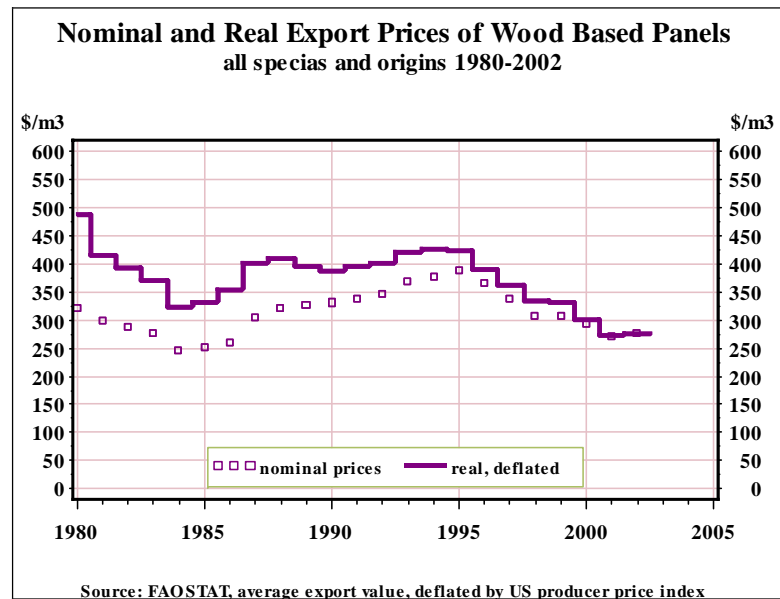


Figure 3.18 illustrates one of the most dramatic phenomena, in the global markets of forest products. The shift in the global export supply of panel products in the last 22 years has been quite revolutionary. The export supply of wood based panels has almost quadrupled in this period. As stated above, this has required many factors: Innovations in products and processes, and investments in large-scale facilities. Indonesian plywood industry is an example of this, together with North American OSB and European MDF.

Figure 3.18 Shift in Global Export Supply of Wood Based Panels, 1980 to 2002

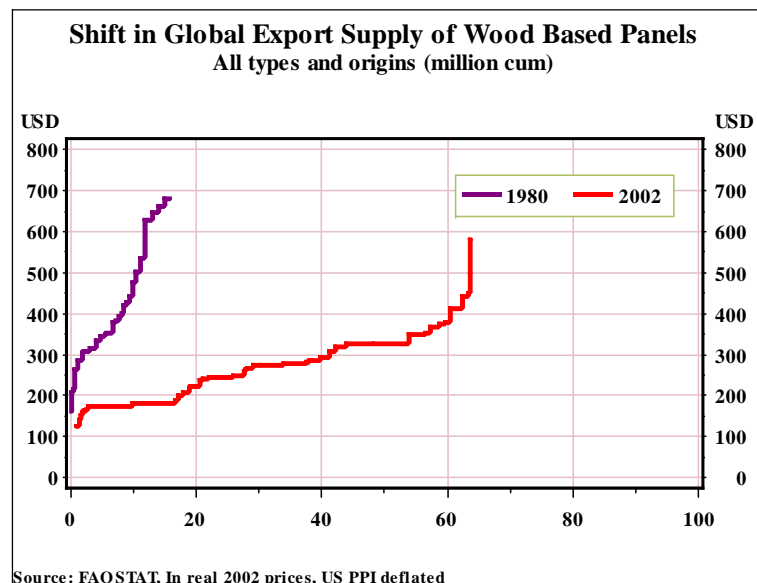
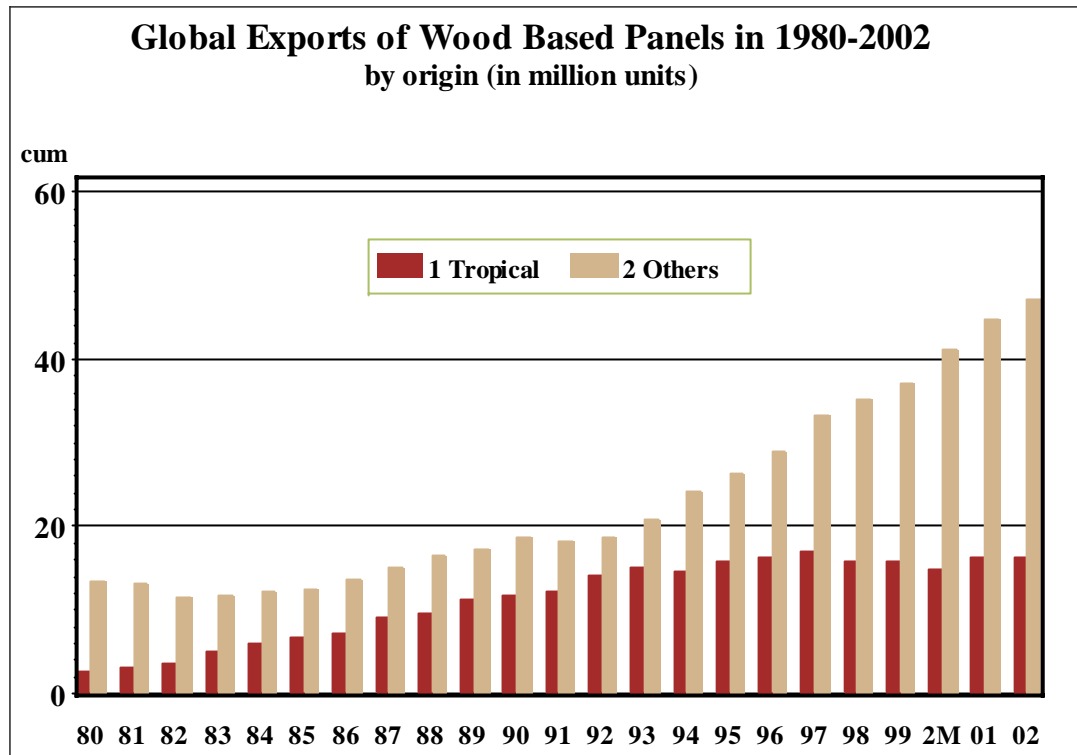


Figure 3.19 illustrates the outcome in global export markets, in terms of relative importance of tropical and non-tropical panels. The tropical countries gained strongly in the 1980's but levelled off about 10 years ago. The non-tropical competitors, instead, have kept growing almost linearly for the same 10 years. It is clear that the competitive market place has not had enough of space for both groups to expand at a fast rate. Annex 7 describes the global trade phenomena of wood based panels in more detail.

Figure 3.19 Share of Tropical Panels in Global Trade, 1980-2002



Source: FAOSTAT

The map in figure 3.20 illustrates the main net trade flows of wood pulp in the year 2000. The net trade flows are predominantly towards east, with the most important exception of Other Asia exporting (its highly competitive hardwood pulp from plantations) to USA. Table 3.5 covers all the inter-regional net trade flows in wood pulp with some more details.

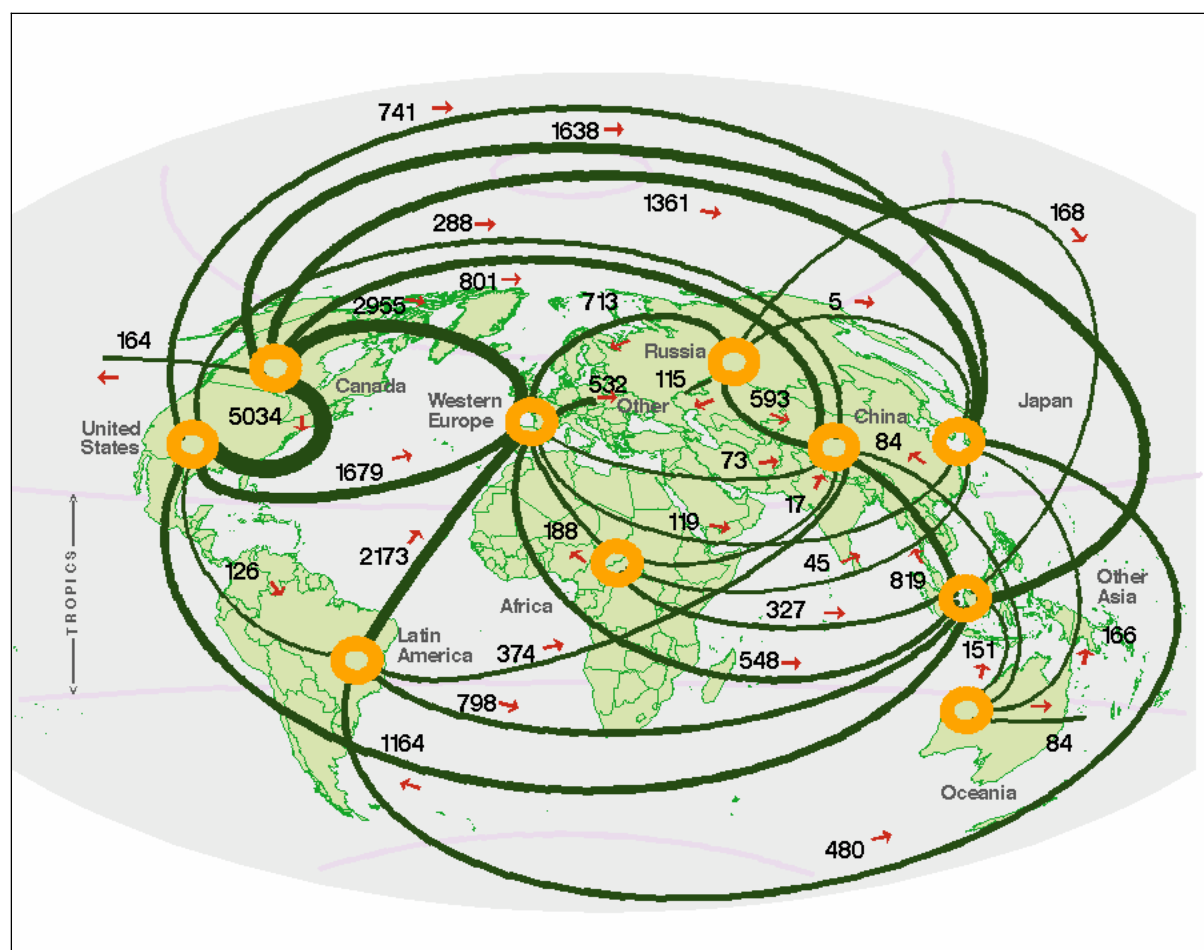
Figure 3.21 illustrates the development of wood pulp prices in the period of 1980 to 2002. The very strong cyclicity of the pulp market price formation is the dominant feature. This is characteristic to a commodity (or actually a semi-finished product) market, where capacity expansion is quite costly and requires time. The second important feature is the trend-wise reduction of the real price of internationally traded wood pulp. This again is a net result from improved technology, broadened raw material base (hardwood becoming utilisable) and gains from economies of scale (through investments in large size mills and production lines). The related technology transfer in itself is partly a trade driven phenomenon.

One should consider the effects of the techno-economic development of the pulp industry and market from the sustainable forest management (SFM) point of view. There are several implications: (i) When the overall demand for pulp has been increasing with the growth of the economies, consequently a demand has been generated for a higher portion of the wood raw material base. This again has created economic rent or stumpage value for an increasing volume of small sized wood. On the level of forest management practices, several incentives are being created: more profitable planting, higher recovery harvesting, smaller dimension recovery, and financially feasible thinning regimes. (ii) When earlier, only softwood was usable for pulping, now hardwood became an additional choice. Consequently, stumpage value was created for small sized hardwoods. This again created new opportunities for forest management: usefulness of mixed tropical hardwood as industrial raw material, and financially attractive fast growing tropical plantations. This made a new radical regime economically feasible, where tropical forests were harvested for raw material and as a second step planted for genetically favoured (or improved) species.

Figure 3.22 illustrates the overall export supply shift in the markets of wood pulp in the past 22 years (1980 to 2002). One can conclude that the global export supply has roughly doubled while the real price has been reduced by roughly 50%. The reduction in global trading prices has been very favourable for some of the stand-alone paper mills. They have been able to source their wood pulp purchases from globally competitive producers, such as South American, South African or South Asian producers. The increased competition in the global pulp market place has put some more pressure on the pulp producers and pulpwood markets of the boreal and temperate zone. While the real stumpage prices of some of these sources had been increasing due to pulp market expansion, later the effect from efficient southern producers has put downward pressure on temperate and boreal real pulpwood prices. This has had an SFM effect too: there is now somewhat less financial incentive for sustainable management of these forests as a pulpwood supply source.

[Further information on the global pulp market is available in Annex A8. Table A8-11, which presents the gross trade flows, and Annex table A8-12, which presents the composition of gross trade in its components.]

Figure 3.20 Main Net Trade Flows of Wood Pulp in 2000 (in 1000 MT)



Source: FAOSTAT Trade Flow Data

Table 3.5 Inter-Regional Trade of Wood Pulp in 2000 (million MT)

EXPORTER	CAN	USA	LAC	RUS	OTH	AFR	OCE	EUR	JPN	ASI	CHN	XXX	TOTAL
IMPORTER													TOTAL IMPORTS
Canada													0.000
USA	5.034												5.034
L.Am. & Car.	0.053	0.126											0.179
Russia	0.005	-0.015	0.004										-0.006
Others	0.032	0.115	0.084	0.077									0.308
Africa	0.026	0.008	0.013	0.017	0.018								0.082
Oceania	0.051	-0.004	0.032		-0.028	0.005							0.057
Europe	2.955	1.679	2.173	0.713	0.071	0.188	0.006						7.785
Japan	1.361	0.741	0.480	0.005	-0.001	0.045	0.166	0.119					2.915
Asia, other	1.638	1.164	0.798	0.168	-0.053	0.327	0.151	0.548	0.016				4.757
China	0.801	0.288	0.374	0.593	0.672	0.017	0.084	0.073	0.005	0.819			3.726
Unspecified	0.132	0.397	0.924	0.038		0.133	0.056	0.603	0.013	-0.133	-0.003		2.161
TOTAL EXPORTS	12.088	4.499	4.883	1.611	0.679	0.715	0.463	1.343	0.034	0.686	-0.003		26.997

Source: FAOSTAT Trade Flow Data

Figure 3.21 Development of Real Export Price of Wood Pulp, 1980-2002

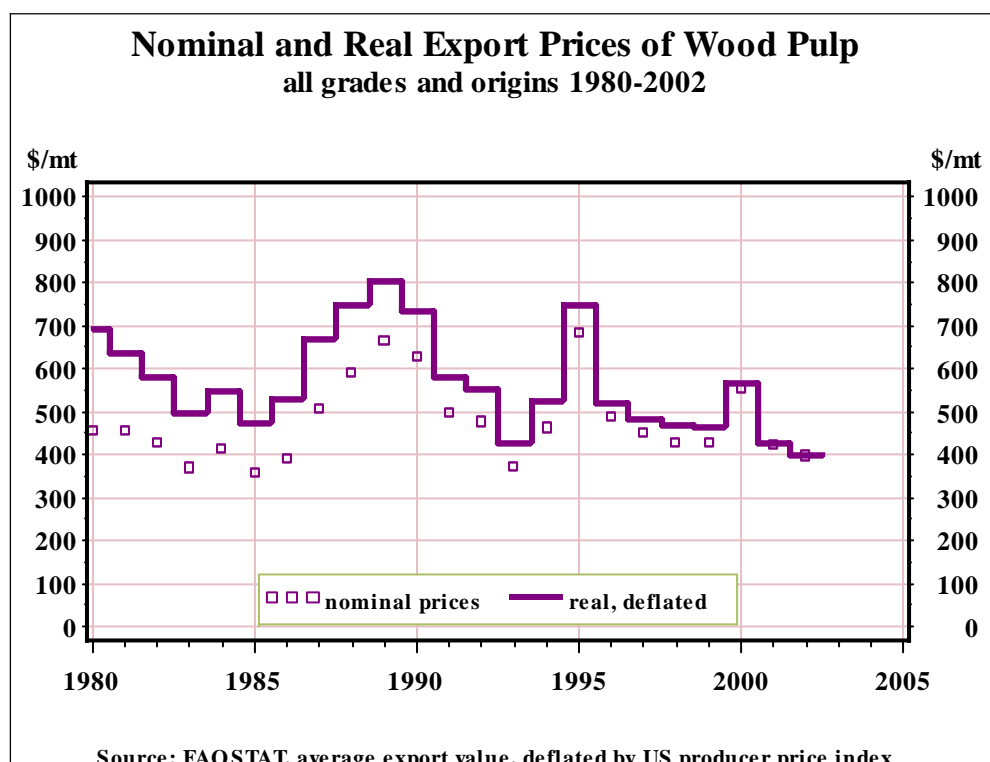
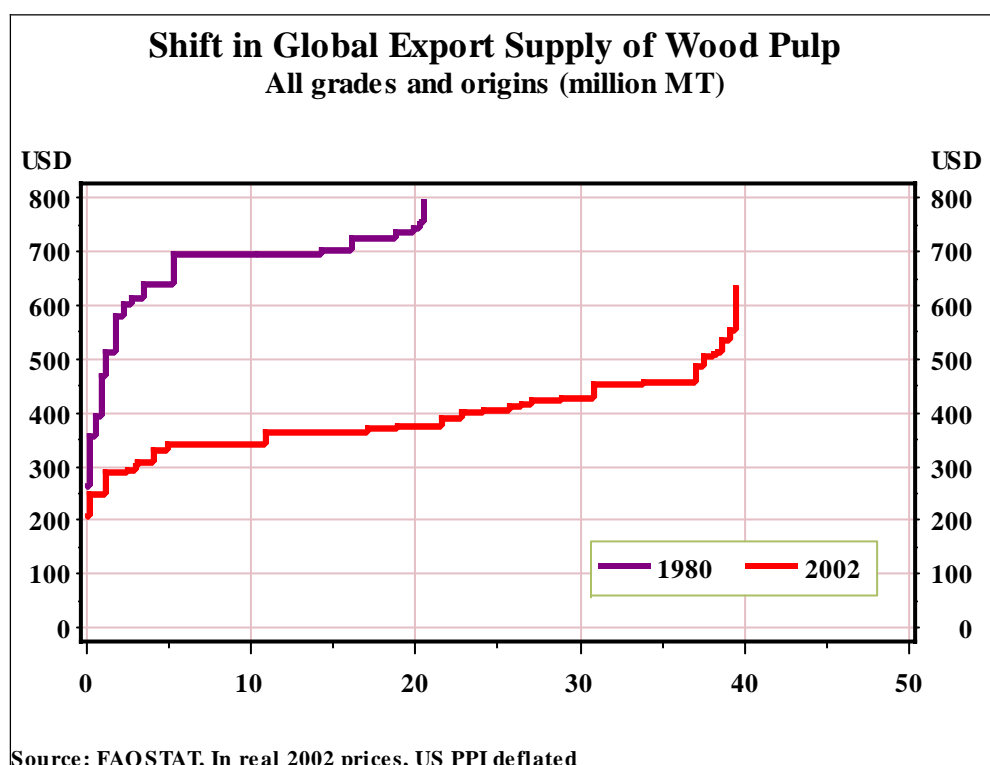


Figure 3.22 Shift in Global Export Supply of Wood Pulp, 1980 to 2002



The map in figure 3.23 illustrates the interregional net trade flows in paper and paperboard in the year 2000. As with the previous forest product categories, there are again strong flows from west to east, but now characteristically for paper, there are very strong flows southward, too. Some new regions are expanding their paper and paperboard production. The expansion of supply is mostly driven by domestic demand (for cultural papers and for packaging of manufactured goods). However, some new large-scale operations have started in order to meet the emerging export opportunities. These are typically based on competitive local plantation pulp.

Table 3.6 describes the inter-regional net trade flows with somewhat more detail than figure 3.23. Both North America and Western Europe have a strong export performance in paper and paperboard. This is not so much due to their forest based material supplies but rather due to their superior competitiveness in technology in the more sophisticated paper and board grades. The large variety of specialised paper grades gives these traditional paper-trading regions a competitive edge, and a wide export supply base as such.

[Annex 3 presents further information on inter-regional gross trade in paper and paperboard. Annex table A3-13 illustrates the global gross trade in paper and paperboard. Annex table A3-14 describes the composition of the gross trade into its components.]

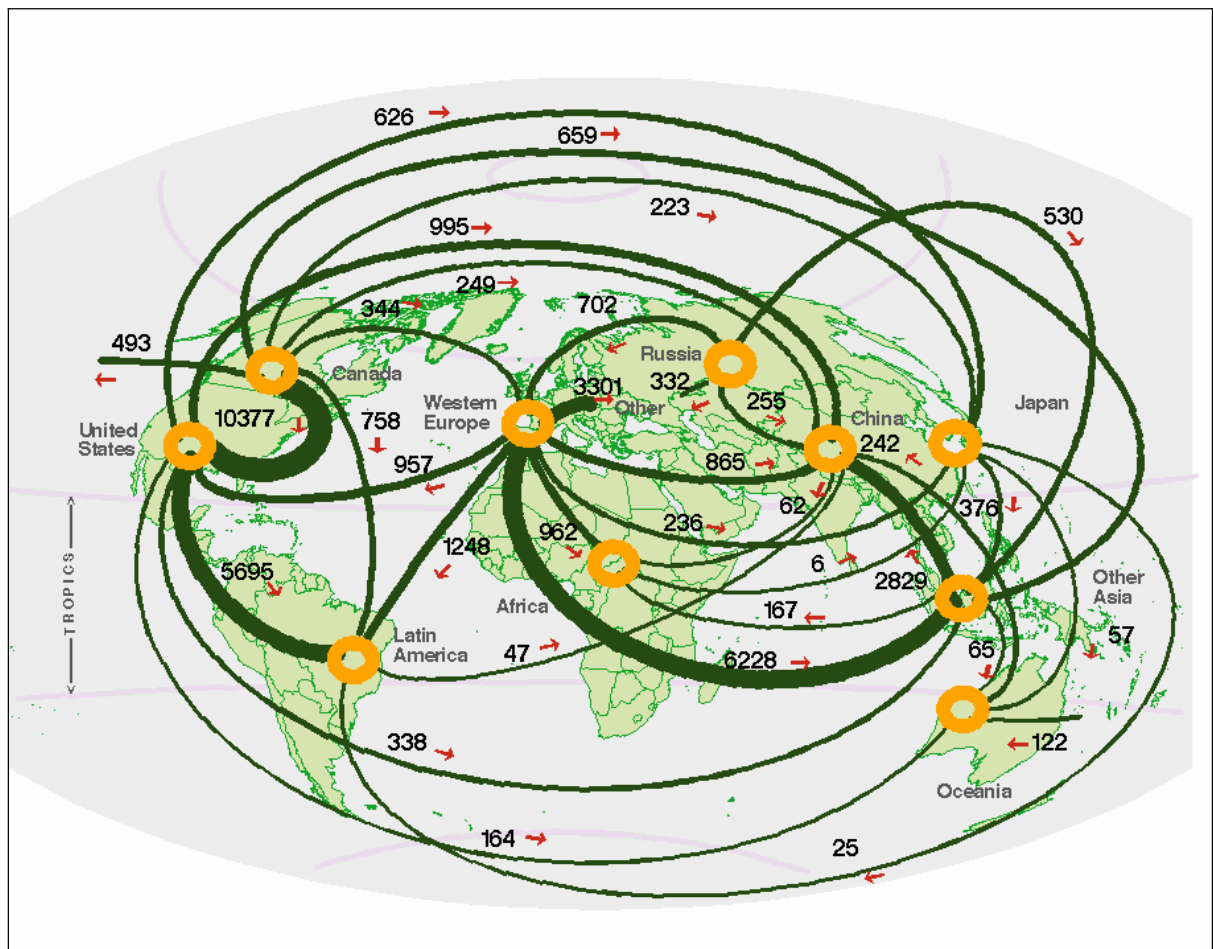
The total gross value of the inter-regional trade in paper and paperboard is USD 106 billion. This makes a major share of the total value of inter-regional trading in the markets of forest products. One should keep in mind that: (i) The domestic markets continue to be much larger than the international trade. (ii) The fuelwood makes a half of global wood use and is usually not accounted for. (iii) Non-wood forest products are only partially accounted for in the market statistics. If one bears these facts in mind, then the real dominance of paper and paperboard markets is not as overwhelming as it seems to be in inter-regional trade value.

[Annex 8 covers some further details on the markets of paper and paperboard. Figure A8-2 illustrates the global export supply of newsprint, and figure A8-3 illustrates the global export supply of other paper and paperboard.]

Figure 3.24 illustrates the very large expansion that has taken place in the international trade of papers and paperboards in the last 22 years. The real prices have dropped, and the supply curve has become characteristically flat. A large number of paper and board grades have become commodities and very competitively traded. Most grades, which enter the international market place, are produced with large machines, with high economies of scale. The net result has been lower real price level and expanded production, including supply for exports.

Figure 3.25 illustrates the development of real prices of paper and paperboard in global markets. The real prices of the whole paper and paperboard aggregate are slightly diminishing trend-wise. This is, however, a very mixed basket, and the development of prices of various paper and paperboard grades is very uneven.

Figure 3.23 Main Net Trade Flows of Paper and Paperboard in 2000 (in 1000 MT)



Source: FAOSTAT Trade Flow Data

Table 3.6 Inter-Regional Trade of Paper and Paperboard in 2000 (million MT)

EXPORTER	CAN	RUS	EUR	USA	JPN	OTH	ASI	LAC	OCE	CHN	AFR	XXX	TOTAL
IMPORTER													TOTAL IMPORTS
Canada													
Russia													
Europe	0.344	0.702											1.046
USA	10.377	0.036	0.957										11.370
Japan	0.223	-0.001	0.236	0.626									1.084
Others	0.135	0.182	0.670	0.099	0.008								1.094
Asia, other	0.659	0.530	6.228	0.338	0.376	-0.343							7.788
L.Am. & Car.	0.758	0.011	1.248	5.695	0.025	-2.897	0.002						4.842
Oceania	0.028		0.570	0.164	0.057	0.021	0.065						0.905
China	0.249	0.255	0.865	0.995	0.681	-0.507	2.829	0.047	0.242				5.656
Africa	0.087	0.135	0.962	0.087	0.006	0.059	0.167	0.043	0.003	0.062			1.610
Unspecified	0.271	0.015	2.061	0.013	0.046	-0.023	0.347	-0.036	-0.101	-0.847	-0.040		1.706
TOTAL													
EXPORTS	13.131	1.865	13.797	8.017	1.199	-3.690	3.410	0.054	0.144	-0.785	-0.040	0.000	37.101

Source: FAOSTAT Trade Flow Data

Figure 3.24 Shift in Global Export Supply of Paper & Paperboard, 1980 to 2002

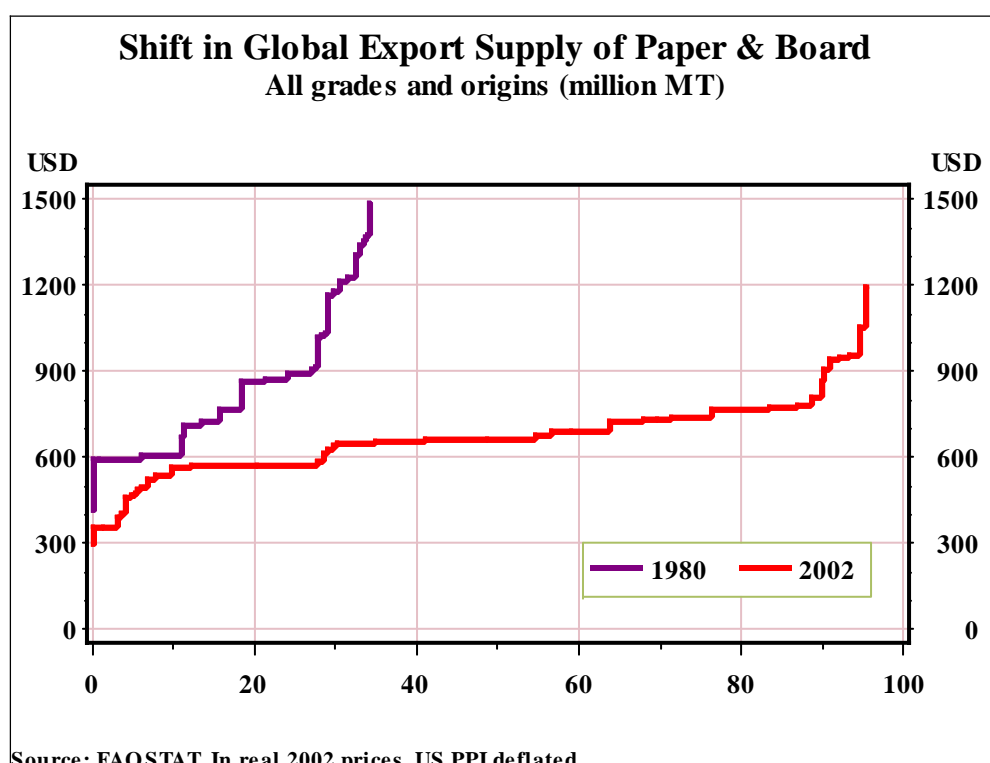
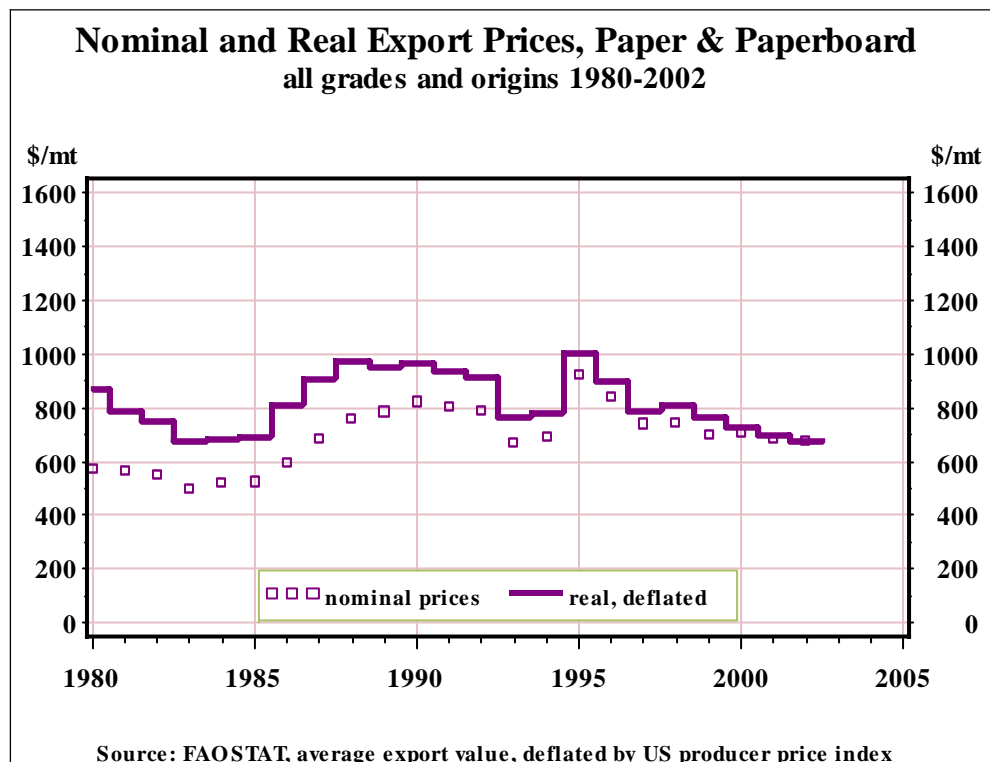


Figure 3.25 Development of Real Export Price of Paper & Board, 1980-2002



3.2.2 Trade of the Tropics and Developing Countries

Issues of deforestation and sustainability

In spite of its limited share of production, trade has been seen by some observers as a major factor contributing to deforestation and forest degradation, particularly in developing countries (*e.g.* Dudley 1992, Dudley *et al.* 1995). In a number of tropical countries in Africa, Southeast Asia and the Guyana Shield, export oriented production has apparently accounted for a significant share of forest loss and degradation. In addition to direct impacts, indirect effects, such as opening up forest areas for encroachment, can become or trigger underlying causes of deforestation.

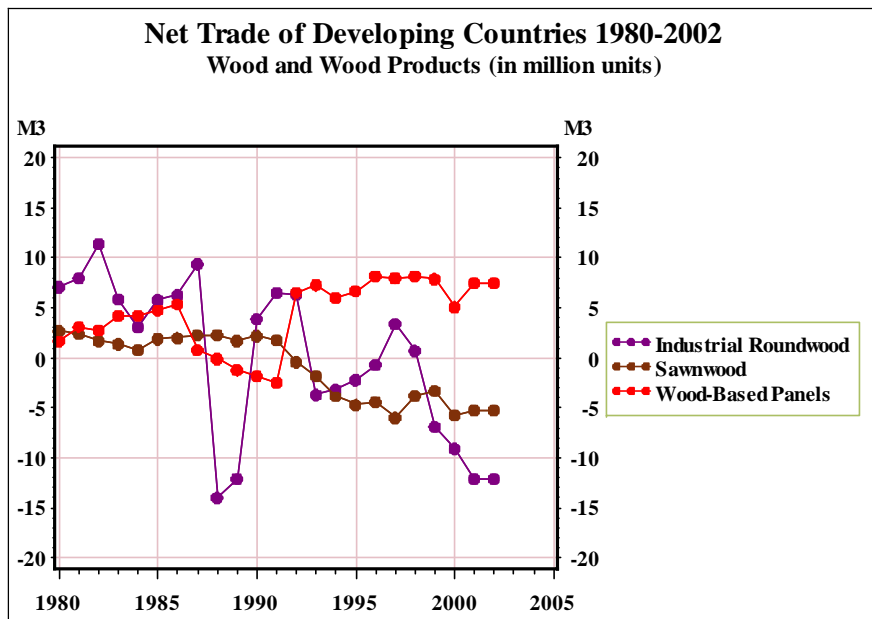
Indirect impacts on deforestation are linked to such factors as changing production and consumption patterns (including expanding demand for food), expansion of subsistence agriculture, demand for fuelwood and charcoal, as well as land tenure patterns. Given these other underlying causes of deforestation, some have concluded that deforestation has little to do with international trade (WTO 1997). But this view misses the point that the interrelationship between trade and deforestation is mostly indirect, and that direct, and indirect effects, are difficult to separate from each other.

Trade based on sustainably managed forests brings socio-economic benefits, thereby creating an incentive for the conservation of forest resources. The higher returns on investment, compared with alternative land uses such as agriculture, are an incentive to conserve production forests (Barbier *et al.* 1993).

Sustainability issues keep becoming more important, and are decisive *e.g.* when considering the "procurement from legal and sustainable sources". The procurement policies and rules, again, may have a decisive role in affecting the competitiveness of various products in the purchase decision. A study prepared by the Subgroup Substitution Project of the Joint FAO/ECE Team in the Forest Industries Sector, stated as follows: "In the past, the most important environmental issues for manufacturing industries were emissions, discharges and waste. These are still very important issues and likely to remain high on the environmental agenda. However, increasingly the focus is shifting towards raw material procurement." (Burrows and Sanness, 1998)

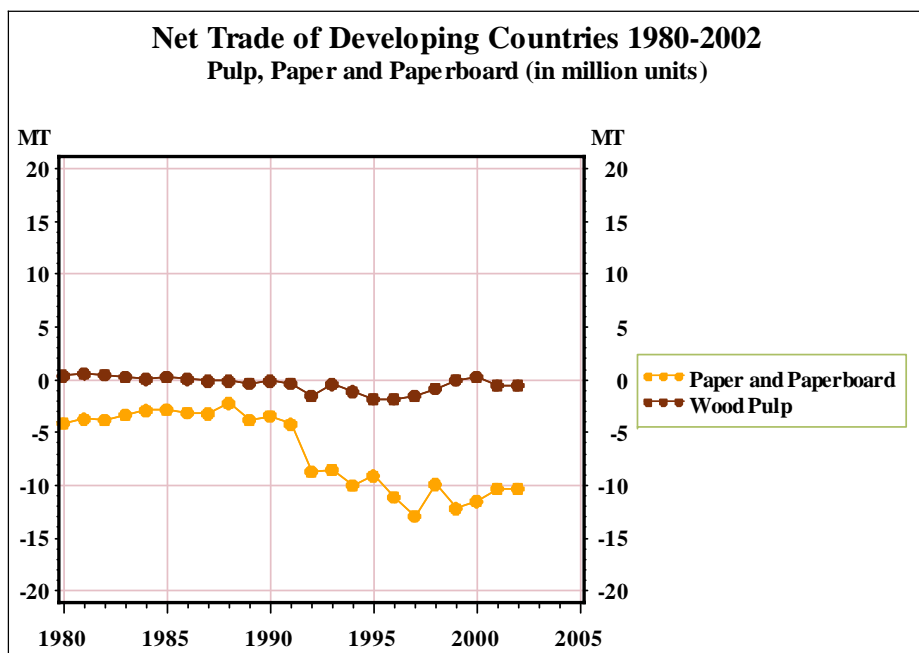
Another study project (Rametsteiner, E., *et al.*1998) researched the perceived environmental friendliness by consumers in Germany, France, Italy and UK. Similarly to some other studies, wood ranked high. In this study, a difference was made between domestic wood and tropical wood. The “environmental friendliness” of tropical wood ranked lower than that of domestic wood or glass, but higher than other substitute material, including plastic, aluminium and steel. The bottom line may be, as stated by Burrows and Sanness (1998): “...The report concludes that substitution of forest products by competing products is accelerating. In some cases, substitution is resulting from environmental claims that are erroneous, incomplete and unproven”. The study continues: “There is a need for international co-operation and action to meet these challenges because of consumers’ growing awareness of environmental issues, their ignorance concerning the forest and forest industry sector and continuing focus on the sector by environmental organisations.”

Figure 3.26 Net Trade of Wood Products by Developing Countries 1980-2002



Source: FAOSTAT

Figure 3.27 Net Trade of Pulp and Paper by Developing Countries 1980-2002



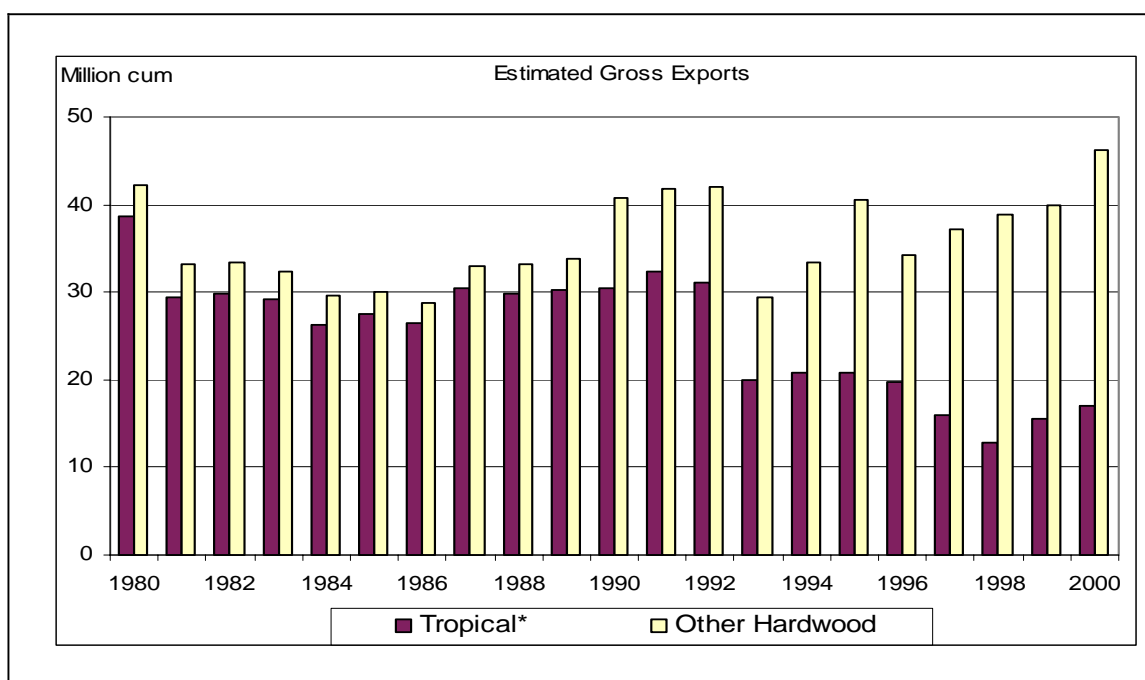
Source: FAOSTAT

Tropical trade in logs, sawnwood and plywood

In previous sections the role of tropics in the trade of some key forest product categories have been presented. Figure 3.8 illustrated the development of the role of tropical roundwood in the international markets. Figure 3.14 illustrates the relative market share performance of tropical and other sawnwood, indicating that tropical volumes have grown only little, while non-tropical sawnwood has expanded internationally.

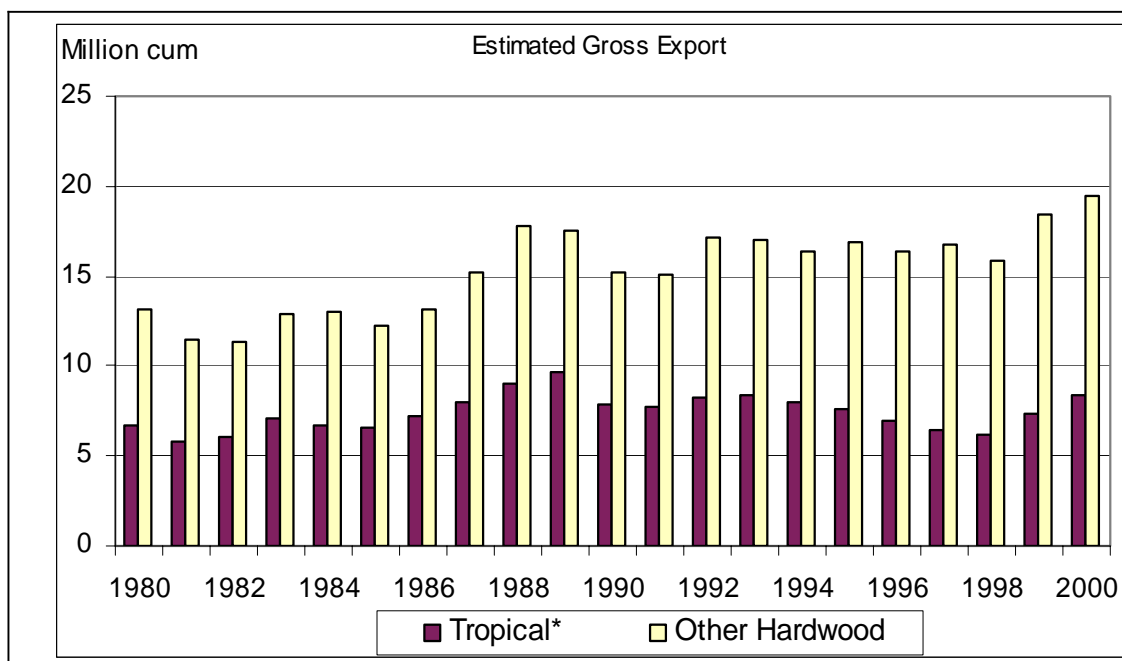
Figure 3.26 illustrates the global trade in hardwood logs during the period of 1980-2000. Hardwood logs have been selected as an example here, due to their importance for developing regions, and to indicate the competition between regions. The measure used is gross export volume, *i.e.* direct sum of country level exports. The quite important role of tropical logs in the international trade of hardwood logs has diminished over the years. Especially during the 1990's, the share of tropical logs has decreased from about 75% of the trade to clearly less than one half. It is important to note that the overall trend in the hardwood log trade has been almost horizontal, with some growth in recent years. In summary, the temperate and boreal logs have substituted for the tropical logs, which have become relatively scarce in supply.

Figure 3.28 World Trade in Tropical and Total Hardwood Logs in 1980-2000



Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates (tropical includes ITTO members)

Figure 3.29 Global Exports of Hardwood Sawnwood in 1980-2000



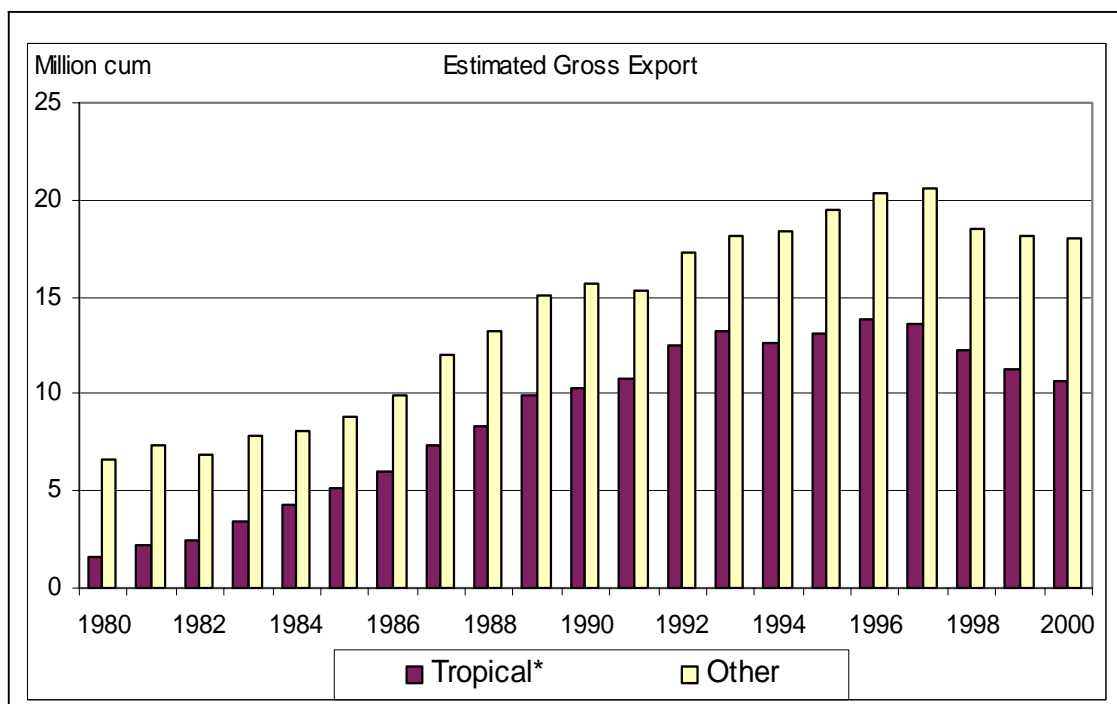
Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates

Figure 3.27 illustrates the development of the global hardwood sawnwood exports, for tropical and other hardwood sawnwood separately, in the period of 1980-2000. In hardwood sawnwood, non-tropical exports have grown faster than tropical. The global overall view reveals that the tropical regions have still a quite important role to play in the global interregional trade in sawnwood (even if supply and demand investigation reveals that an increasing share is getting consumed locally). One has to bear in mind that most of the interregional trade flows, coming from outside of the tropical zone, are of coniferous species.

The economic transportability plays a major role in wood based panel markets. Particleboard and fibreboard are mainly locally used, and almost totally intra-regional trade items. The key products in the interregional trade are the veneer and plywood. Tropical plywood was the success story of the 1980's and early 1990's. Previously, in the illustration of the global annual snapshot of the year 2000 (see figure 3.16) this was reflected especially as a major flow of panels from other Asia to Japan.

Figure 3.28 illustrates the development of global plywood exports. It is important to note that no separation is made by species. Softwood plywood is important component of non-tropical plywood. The global trade in plywood had been increasing very fast until the mid-1990's. The dominant component of the growth was tropical plywood. The whole plywood trade slowed in the latter part of 1990's and tropical plywood suffered more than the rest.

Figure 3.30 Global Exports of Plywood in 1980-2000



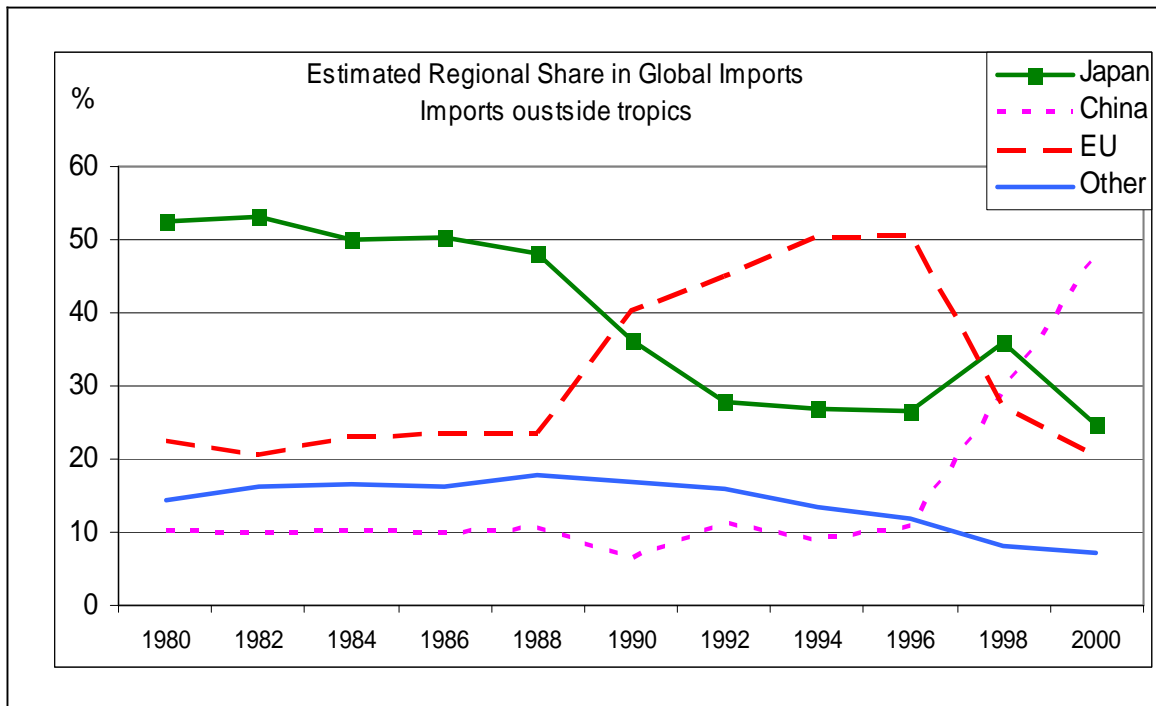
Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates

Figure 3.29 illustrates the development of the import market shares of the main importer regions in the global trade in tropical logs. The import market has gone through very large structural changes. Firstly, Japan has trend-wise decreased its import market share, especially in the 1990s. Even here, the pattern is not smooth. China has very quickly taken a large market share in the tropical log imports in the late 1990's, increasing its share from 10% to almost 50%. This is the largest single shift in the tropical timber trade in the last five years. European Union countries reduced their share as tropical log importers quite dramatically since 1995. In effect, EU's decrease in share is almost as dramatic as the growth of Chinese imports. However, EU still has an import market share of about 20% in global tropical log trade. The trade in logs is concentrating, as Japan, China and EU have increased their joint share in the 1990's.

Figure 3.30 illustrates the development in the import market shares in the global trade of the main consumer regions of tropical sawnwood in 1980-2000. Japan has radically decreased its import share of tropical sawnwood in the latter part of the 1990s. China has effectively compensated for the change, at least in volume terms. EU has maintained its share at over 40%, USA has remained at 5-8% level, while the rest of the world has decreased in import share of tropical sawnwood.

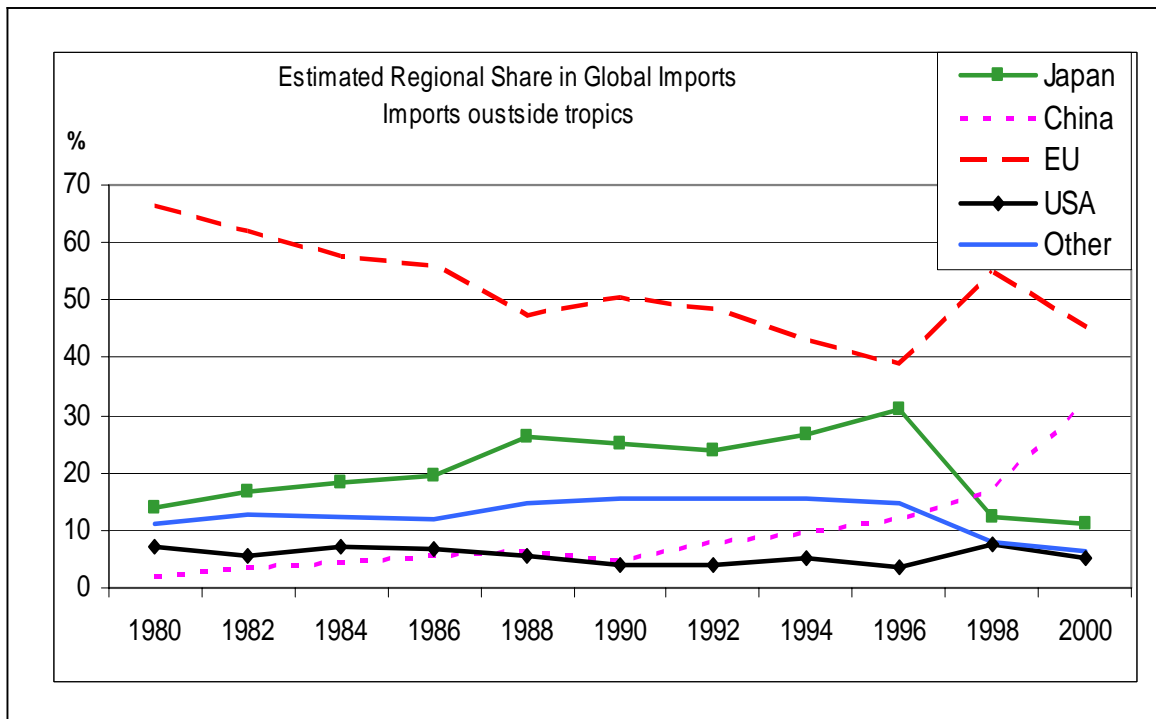
Tropical share in consumption of other regions

Figure 3.31 Import Shares of Consumers in Tropical Logs in 1980-2000



Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates

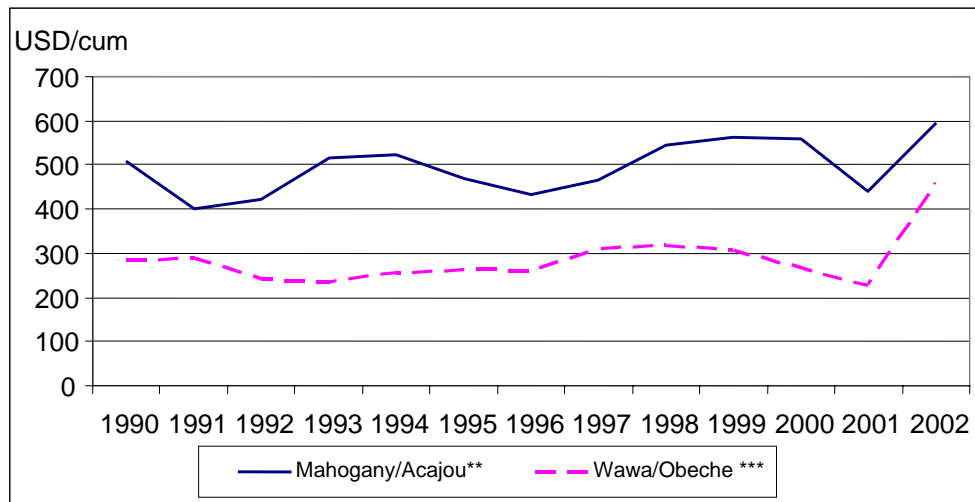
Figure 3.32 Import Shares of Consumers in Tropical Sawnwood in 1980-2000



Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates

Prices of tropical timber

Figure 3.33 Price of Ghanaian Sawnwood 1990-2002



Source: ITTO, 2002 (bold line in real price, deflated by ITTO secretariat)

Figure 3.33 illustrates the price development of selected (relatively consistently reported) case of tropical sawnwood. The case covers the species mahogany and Acajou on one hand, and Wawa/Obeche, on the other. One can observe the cyclical nature of the prices, but in terms of the longer-term development, an almost flat trend can be observed.

Value added forest products from tropics

Table 3.7 summarises the export development of secondary processed wood products (SPWP) from International Timber Trend Organization (ITTO) producer countries in 1996-2000. In the descriptions above, the exports of SPWP was measured by approximate estimates of its volume. A more meaningful presentation is in value terms, as in table 3.7. This table differentiates the export destinations by ITTO producers, consumers, and the world total. One can conclude that only 1% was traded between ITTO producers, and that about 10% were directed to outside ITTO member countries.

Asia Pacific region dominates the exports of tropical SPWP and covers almost 85% of the export value. Most of the remaining exports come from Latin America. The very encouraging phenomenon is the strong recovery and overall growth of SPWP exports in 1999 and 2000. Indonesia, Malaysia, Thailand, the Philippines and Brazil have all reached their record exports in those years. In total the exports of SPWP has grown by 28% in four years.

Table 3.7 Developing Country Exports of Secondary Wood Products

Exporter	To	1996	1997	1998	1999	2000
		million USD				
Asia Pacific	World	3 768	3 540	2 905	4 251	4 685
	ITTO Prod.	37	36	31	53	28
	ITTO Cons.	3 300	3 038	2 503	3 718	4 228
Latin America	World	545	607	581	716	791
	ITTO Prod.	13	13	19	20	28
	ITTO Cons.	452	506	463	583	633
Africa	World	14	10	4	13	27
	ITTO Prod.	0	0	0	0	0
	ITTO Cons.	13	10	4	12	27
Producers	<i>World</i>	4 327	4 157	3 490	4 980	5 538
	ITTO Prod.	51	49	49	73	56
	ITTO Cons.	3 764	3 553	2 970	4 313	4 920

Source: Annual Review and Assessment, ITTO 2001

Imports of SPWP

Table 3.8 demonstrates that the import market of the secondary processed wood products (SPWP) is a very dynamic one. It is important to note that this table includes all SPWP, where tropical SPWP is just one component. However, the table makes a distinction between tropical SPWP and the other.

The most important conclusion from table 3.8 is that while the SPWP market has been growing fast (18% in four years), the imports of SPWP from tropical sources has outpaced the average global growth and increased by 26% in four years. The total net value by major importers of SPWP from ITTO producer countries was at 5.2 billion USD in the year 2000.

UK, France and Belgium have all clearly increased their imports of SPWP from tropical countries. The Netherlands is a special case, it has increased its imports strongly but most of it from outside of tropics, which again have suffered and lost in market share. Also, the case of USA is worth a closer look, it has increased its SPWP imports by a massive 88% in four years (to a level of over 12 billion USD, over twice of the total tropical SPWP trade value). Even if the tropical SPWP imports to USA have increased by 50% in four years, they have still lost in market share.

Table 3.8 Major Importers of Secondary Wood Products in 1996-2000

Importer	From	1996	1997	1998	1999	2000
		million USD				
Germany	World	5 696	5 129	5 367	5 053	4 548
	ITTO Prod.	361	361	333	338	363
	ITTO Cons.	3 452	2 943	3 062	2 687	2 120
United Kingdom	World	1 656	1 925	2 182	2 612	2 573
	ITTO Prod.	306	349	371	423	499
	ITTO Cons.	1 072	1 256	1 469	1 730	1 646
France	World	2 331	2 170	2 360	2 520	2 568
	ITTO Prod.	203	242	229	270	323
	ITTO Cons.	1 867	1 640	1 829	1 888	1 850
Belgium/Lux.	World	1 383	1 354	1 451	1 529	1 439
	ITTO Prod.	70	114	131	156	157
	ITTO Cons.	1 218	1 120	1 170	1 225	1 117
Netherlands	World	1 453	1 338	1 311	1 457	1 812
	ITTO Prod.	232	279	267	255	184
	ITTO Cons.	1 048	878	833	981	1 531
Austria	World	1 287	1 142	1 126	1 147	1 000
	ITTO Prod.	18	18	15	14	15
	ITTO Cons.	1 049	908	890	902	753
USA	World	6 509	7 766	9 303	11 489	12 256
	ITTO Prod.	1 402	1 530	1 696	2 106	2 103
	ITTO Cons.	3 873	4 863	6 106	7 774	8 579
Japan	World	2 750	2 589	1 964	2 224	2 713
	ITTO Prod.	916	841	645	784	924
	ITTO Cons.	1 488	1 442	1 096	1 199	1 493
Switzerland	World	1 431	1 199	1 304	1 325	1 238
	ITTO Prod.	13	13	15	18	16
	ITTO Cons.	1 356	1 122	1 206	1 219	1 122
China	World	1 000	1 167	1 109	1 214	754
	ITTO Prod.	63	66	83	76	78
	ITTO Cons.	888	1 050	992	1 107	659
ITTO Consumers	World	29 820	30 600	32 606	36 270	35 284
	ITTO Prod.	4 155	4 456	4 408	5 203	5 245
	ITTO Cons.	20 534	20 791	22 479	24 825	23 876

Source: Annual Review and Assessment, ITTO 2001

Conclusions from description of forest product trade

- ❑ As described in this chapter, the long distance trade of raw material is rather limited, especially in value terms as presented here. The key driver is the better transportability of processed products – if the market access is there!
- ❑ Traditionally, trade in logs has been an important export income source for developing countries. The dominance of tropical logs in the international trade of hardwood logs has diminished over the years. Especially during the 1990's, the share of tropical logs has decreased from about 75% of the trade to clearly less than one half. It is important to note that the overall trend in the hardwood log trade has been almost horizontal, with some growth in past years. The temperate and boreal logs have substituted for the tropical logs, which have become relatively scarce in supply.
- ❑ Globally, the supply of wood fibre will be increasingly met from managed natural forests or plantations. The role of tropical forests as an excess supply area, is necessarily becoming smaller in

relative terms. The global policy issue is, if the tropical forests will be valued for the full range of services they are able to provide. The danger is that policies and investment support in the fast growing plantation forestry may reduce interest and perceived value of the tropical forests, thus speeding up the clearance for other uses.

- Most of the value created through international exchange of forest based products comes from value added products. Measured by the value of inter-regional gross trade (as was used in map illustrations of this chapter), pulp and paper create more than ten times the value of wood raw materials.
- A number of developing tropical countries have been able to create sizeable export trade by shifting the production to value added products. A range of policies and other measures have been used to facilitate this development. These measures have included instruments that have established market access barriers or impediments (such as log export taxes or log bans). Some other instruments have been closely related to market access issues (such as subsidised industrial development, fiscal incentive schemes or low concession fees on wood from government owned forests).
- Successful industrial wood based export countries in the tropics have become a part of the highly competitive global trade. There are signs that the prices of commodities have become depressed. Increasing liberalisation is likely to further enhance the competition. The challenge is to keep the value chain in such shape that the forest resource retains a value high enough to support the SFM of the natural resource.

3.3 Trade Restrictions for Forest-based Goods and Services

3.3.1 Market Access, Barriers to Trade and Impediments

Factors and measures related to market access

The past decades have seen an international movement towards elimination of many of the former barriers to trade, especially of tariffs. The positive effects of the overall globalisation have been generated, as the friction has been lowered and the mutually beneficial transactions have increased. However, work remains to be done, especially in such products, which do not easily fit into standard commodity categories. For a number of reasons, tropical timber belongs to this category.

Factors and measures on market access cover a large range of issues and instruments. This is in the very focus of this report and will be discussed in more detail in the following chapters. Both exporter and importer countries may have intentional or unintentional measures, instruments and constraints in place, which in fact form market barriers or impediments.

International trade instruments

In principle, and in enforcement of the international trade legislation, the forest-based products are treated in the same manner as any other internationally traded commodities. Of course, due to the nature of the products, certain aspects and regulations have more specific relevance. Such features include phyto-sanitary measures, concerning unwanted aspects of the bio-diversity of the place of origin.

Even after enforcement of the full arsenal of the international trade regime, a large number of technical and non-technical issues may remain unsettled. There are several groups of issues involved, including: (i) Environmental and conservation issues, (ii) Product quality issues, (iii) standards, and (iv) packaging, labelling and testing. Even if all technical hurdles would be overcome, important non-technical ones remain. These latter issues are often related non-trade policies of governments, or on preferences of the local consumers and local governments.

International trade agreements

The core of international trade regime is the WTO legislation. The starting point was based on the General Agreement on Tariffs and Trade (GATT). The regime is intended to ensure proper functioning of free trade, while taking into account the protection of the environment. Several other WTO treaties contribute to the total international trade regime. These include the agreements on: Sanitary and Phyto-sanitary measures (SPS); Technical Barriers to Trade (TBT); Trade Related Investment Methods (TRIM); Trade-Related Intellectual Property Rights (TRIPS). A number of other agreements (anti-dumping, customs valuation, pre-shipment inspections, rules of origin, import licensing, subsidies, safeguards) also exist within the WTO framework.

In terms of enforcement, the international trade regime consists of three components: (i) at the very core are the rights and rules, which are supplemented with (ii) procedures, and (iii) compliance mechanisms.

Multilateral environmental agreements

The Multilateral Environmental Agreements (MEAs) are legally binding international agreements with a global scope. The MEAs have been negotiated between governments to take a joint action to mitigate environmental threats. The basis was laid for the creation of MEAs by the United Nations Conference on Environment and Development (UNCED) in 1992.

A large number of MEAs address issues that have at least partial relevance to forestry. The Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention to Combat Desertification (UNCCD) are arguably the most important from the forestry point of view. There are several others with specific relevance.

The mutually supportive role of the international trade regime and the other multilateral conventions and agreements, specifically the multilateral environmental agreements, has become of a growing concern. MEA secretariats, WTO and non-governmental organisations (NGOs) have to various degrees participated in a process, which is hopefully leading towards a higher coherence of the two large bodies of legislation.

3.2.2 Tariff Barriers for Wood and Wood-based Products

Exporter related barriers to trade

Export restrictions are still of considerable significance. They include total bans, export quotas, or selective bans based on species; direct charges such as export taxes or export levies; indirect quantitative restrictions due to controls on harvest levels; and administrative controls such as permits and licenses. Export restrictions are common in most developing countries and in some developed countries.

In the past, export taxes were used by tropical timber exporting countries primarily as a means to raise revenue from exports of roundwood and many countries continue with this practice. In a way, there was an option to collect the revenues either at the border or at stumpage. Typical export taxes were in the range of 10-20% for logs. The export taxes for processed products, sawnwood, veneer and plywood were usually negligible or small. With an increasing need for economic development, promotion of forest-based industries has become more important. The policy objectives have generally shifted to industrial investment incentives, and export taxes were replaced by strategic export bans or restrictions.

The export bans have been criticised from the point of view of effectiveness and cost. For example, the efficiency of wood conversion stayed low, partially due to export restrictions. The restrictions worked in the sense that they lowered competition on the roundwood markets, and thus lowered log prices. From the point of view of economic production function they caused substitution of wood for other factors of production. The end result was wasteful wood raw material use, *i.e.* low product recovery rates from logs, and unnecessarily high harvesting area and impact on forests. Some studies have indicated that the

restrictions have been effective in contributing to the industrial development goal, but at a substantial financial cost (Barbier *et al.* 1995).

A key conclusion to be drawn from the Asia-Pacific experience is that logging bans are neither inherently good nor bad as natural forest conservation and protection policy instruments. Logging restrictions are simply one set of policy tools available to decision-makers within a spectrum of options and alternatives. If bans are adapted selectively and used in combination with other complementary policy instruments, they can help assure that natural forests will be sustained and will continue to contribute to enhancing the well-being of the peoples (Durst *et al.* 2001).

Export restrictions are commonly used to encourage and promote greater domestic processing by protecting local industry from import competition, enabling the local industry to obtain logs at cheaper prices, encouraging industry into further processing by banning the export in log form, *etc.* Since export bans are technically illegal under Article XI of GATT, many countries (such as Indonesia and Malaysia) are now turning to other measures, ranging from export taxes to permits and licenses, in place of direct quantitative controls. In recent years the focus has shifted towards encouragement of value added timber products, including placing export controls on intermediate products such as sawnwood, and even more recently towards forest sustainability issues, where the intent is to reduce overall pressure on the resource. (Bourke, 1999)

Importer related barriers to trade

Trade in forest-based products is often subject to tariff and non-tariff barriers. Even though the former have been significantly reduced as the result of the Uruguay Round, they still represent a restriction, particularly in the context of tariff escalation (higher tariffs are applied to value-added products than raw material or intermediate products). The impact of tariff reductions is limited by the fact that some large importers did not participate in the Uruguay Round (*e.g.* China). However, a number of countries that did not participate in the Uruguay Round, have by now undergone accession (most notably China), and their tariffs are on their way down also.

Even low tariffs may still be significant in some cases, especially where long distances are involved because the duty is charged on the basis of CIF value, rather than FOB value. In addition, tariff escalation for some finished products, *e.g.* for panel products, builders' woodwork items and furniture is significant. Lower tariff barriers for developing countries, in the form of GSPs, which are discretionary, tend to retain high tariffs for these finished products. It is unclear whether they are enough to exclude some developing countries from exporting such products to developed countries since there may be other factors, which may influence that outcome (Bourke and Leitch 2000). Nonetheless, one impact of this tariff escalation may be that developing countries are increasingly dependent on raw material and basic commodity export. Annex 3 summarises selected relevant tariffs of wood products.

Codes and standards are necessary in international trade as they define the criteria of products and services from the producer to the consumer. They include importer country building codes and approval systems. Testing procedures with respect to various standards are a part of the specification. The required testing procedures may be not easily adapted to the local conditions. Code harmonisation, and creation of performance-based standards will facilitate trade but their development has typically progressed only slowly.

Standards in relation to plant health are generally acknowledged legitimate. However, the complexity and severity of the requirements may have an effect on trade and be interpreted as impediment by exporters. In recent years, environmentally motivated NTMs have become more common. The WTO rules make some exceptions to the main trade rules, based *e.g.* on conservation of exhaustible natural resources. As a main rule, such environmental measures as voluntary certification are considered to be outside the WTO rules. There is a concern about discriminatory treatment, as the same standards are not applied to all countries, and especially to all competing materials.

Standardisation is an important NTM issue. For example, the International Technical Tropical Timber Association (ATIBT) has a "Commission 3, Standards and Uses". This commission works on standards

and rules effecting tropical timber and its products. The commission works towards the progress of tropical wood standardisation as well as its integration in the new standards of utilisation.

The two principal missions of this commission are:

- To represent the ATIBT in front of the large international standardisation organisations such as the ISO and CEN
- Compiling and promoting of the ATIBT International grading and measuring rules

To date the achievements of the commission are the following:

- Drawing up of a publication entitled: “Terminology of round and sawn tropical wood”, due out for publication this year
- Following and evaluation of the African sawnwood and Okoume rules, in collaboration with the ATIBT arbitration chamber
- Commission 3 is currently working on the realisation of a practical commercialisation guide for peeled, sliced and sawn veneers. The object of this guide is to favour the commercialisation and regulation of these products. This document is neither standard, nor a regulation, and in addition integrates the existing CEN and ISO recommendations concerning plywood (It is planned that the guide will be available for distribution by the end of 2002).

3.3.3 Development of tariffs, taxes, quotas and subsidies

Subsidies are relatively common in the forestry sector to promote reforestation and other investment where the returns are too low to attract private investment. Subsidies have also been used for strategic reasons, *e.g.* to create a critical mass of wood supply to encourage industrial investment. From the point of view of trade policy, incentives, particularly financial subsidies, influence the competitiveness of individual producers. For example, subsidies (from low royalty rates) have been a trade issue in the bilateral negotiations on a softwood lumber agreement between Canada and the United States. But subsidies are a concern for sustainability of forest management also, for example, in natural forests where they can encourage excessive harvesting levels. Subsidies to alternative land-uses can also lead to undue clearing of natural forest land.

The WTO Agreement on Subsidies and Countervailing Measures specifies disciplines on the granting of subsidies and taking action against subsidies given by other countries.²⁹ Both production and export subsidies are recognised. Three categories of subsidy are identified: (i) prohibited subsidy, (ii) permissible subsidy, and (iii) actionable subsidy (otherwise permissible, except if they cause injury or threat to domestic industry of the importing country).

Among the permissible subsidies are (a) non-specific subsidy (with regard to industrial unit or sector), and (b) subsidies which are specific but meant for research and development purposes of disadvantaged regions or for environmental purposes. Counter measures and countervailing duties can be imposed by injured importing countries in certain circumstances. The Subsidies Agreement establishes special provisions for developing countries, including exemptions from the prohibition of export subsidies in countries with a per capita GNP of less than USD 1 000 per annum.

The low rent capture in tropical forest concessions prevailing in many countries is an implicit subsidy that has been considered one of the main reasons for excessive harvesting and forest degradation. While such implicit subsidies may not easily qualify as a subsidy under the WTO criteria (and therefore are not subject to WTO discipline), they are a source of serious concern (*e.g.* IPF 1997).

Fiscal incentive schemes have enabled such countries as Brazil, Chile and Uruguay to develop large-scale export-oriented industries. The experience of Brazil indicates that, when the fiscal incentives are removed, the supported activity (tree planting in this case) will drastically decline. From the environmental viewpoint, the expansion of industrial plantations in these countries, and elsewhere, has been criticised as natural forest area has been converted to “monoculture”. More recently, national legislation has been

²⁹ For the main body of WTO legislation, see Section 5.1.

instituted to seek an acceptable balance between the objectives of conservation and economic development. In Brazil, for example, 20% of each holding used for tree planting is to be reserved for natural vegetation as a “legal reserve”.

The dispute between USA and Canada on the countervailing duty to compensate forestry subsidies shows that the issue can be raised in trade negotiations even though forest policies have largely been perceived as a national issue. The USA has claimed that Canada subsidises wood production through low royalty fees from forest concessions, such that the production cost is lower than economically justified. At the same time, it is claimed that production in the US national forests is also subsidised, as many of the costs are financed by Congressional appropriations (Repetto *et al.* 1992). Such subsidies expand the export supply of softwoods and temperate hardwoods from the US and Canada. There is a risk that such subsidies are encouraging oversupply and overuse, resulting in negative environmental impacts (*e.g.* CO₂ emissions) (*cf.* Repetto 1993).

Another example of a subsidy in this context is government financial support to forest road construction to facilitate timber extraction. Environmental groups in USA have targeted these subsidies, to protect biodiversity. It has been an issue in some European countries also.

It needs to be pointed out that subsidies in related sectors may have adverse environmental impacts on forests. Agricultural subsidies that make crop production or grazing an artificially attractive land use has led to conversion of natural forests (Laarman 1995). Such conversion has proved to be unsustainable if the soil is too poor or gets depleted as a result of removal of the vegetation cover. Similar effects are observed in measures, which depress the market price of land. Within the WTO, agricultural subsidies are covered by the Agreement on Agriculture, not under the Agreement on Subsidies and Countervailing Measures.

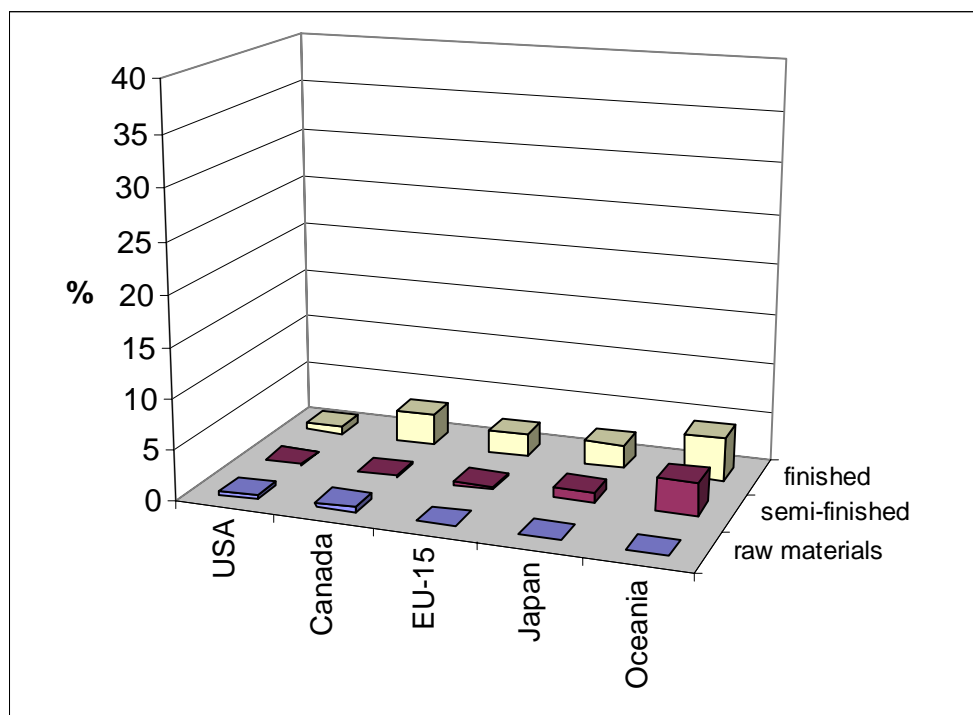
Subsidies that make domestic prices differ from border prices risk generating external environmental cost, as they may promote wasteful production in resource use. In forestry however, subsidies are typically used to correct policy failures in a partial manner, rather than addressing such fundamental issues as under pricing. It is generally politically easier to apply subsidies than to remove them or increase stumpage prices on government lands. Subsidies in this context are not considered as trade policy instruments, but as stated above, they significantly affect production and, at the same time, the use and management of land resources, and thus impact on the environment.

The previous discussion has reviewed the impacts of production oriented subsidies. There are also environment-related subsidies through grants, tax concessions and other support schemes to promote research and development as well as implementation of sustainable forest management practices. Several notifications of information supporting the integration of environmental measures in the forestry sector have been made in the WTO (WTO 1997).

In general, the elimination of subsidies could yield trade and environmental benefits. From the conservation point of view, subsidies as they have been applied in the past, have often encouraged land use for plantations with legitimate development objectives in mind. Without rules and disciplines that take into account conservation aspects, the impact of subsidies will often be negative. However, necessary incentives to set the process of forest management in motion in developing countries may require the use of well-targeted and temporary subsidies, which minimise rent seeking behaviour (Hueth 1995). Therefore, in addition to transparency, appropriate policy guidelines for the type of activities supported, are likely to be needed to avoid incentives in forestry from becoming a trade issue. Furthermore, a reconsideration of how the relevant trade rules might be adjusted to better support environmental ends would be appropriate (Simula 1999).

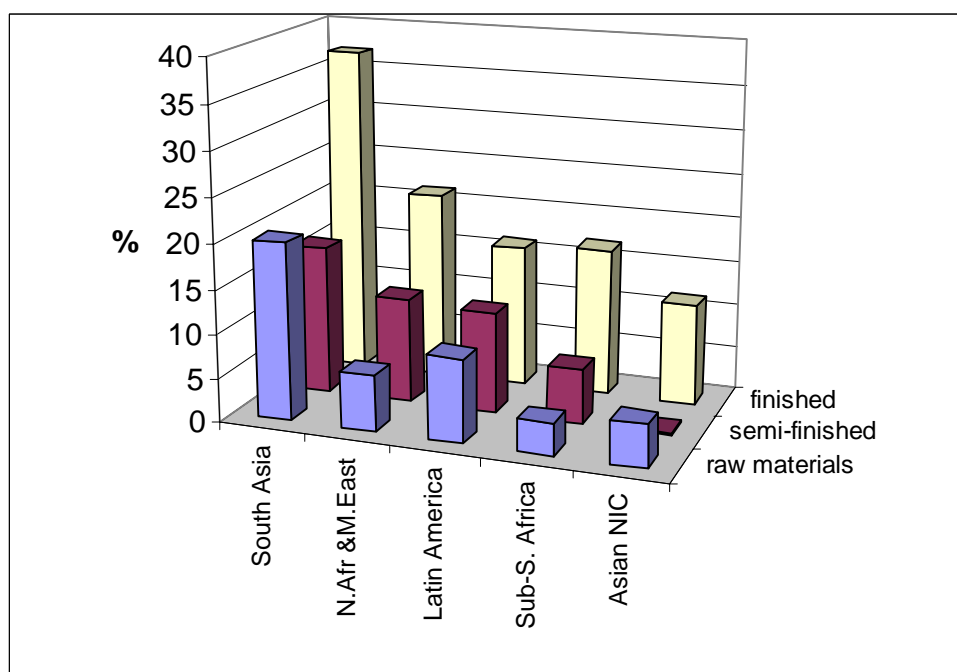
Figure 3.38 illustrates the post-Uruguay Round tariff levels of wood products by main industrialised regions. The main focus is on the tariff escalation. At least on the average regional level it seems clear that the processing stage is an important trade policy issues, and is reflected in the applied relative tariff rates. In general the tariffs escalate from raw materials to finished products, semi-finished products are often (but not always) in between.

Figure 3.34 Tariff Escalation: Wood Products in Developed Markets



Source: UNCTAD TRAINS, 2003; UNCTAD, 2003 (applied tariff rates)

Figure 3.35 Tariff Escalation: Wood Products in Developing Markets



Source: UNCTAD TRAINS, 2003; UNCTAD, 2003 (applied tariff rates)

Figure 3.39 illustrates the post-Uruguay Round tariff levels of wood products by main developing regions. Several conclusions can be made. While the main focus is still on the tariff escalation, the overall level of applied tariffs is dramatically higher compared with industrialised regions. The existence of escalation is very strongly demonstrated. In the two Asian sub-regions, the semi-finished tariff rates are lower than for raw materials or for finished goods.

As a general comment from figures 3.38 and 3.39, one can state that some scope for tariff liberalisation remains even in the industrialised countries, especially in manufactured products. No scope for very dramatic tariff reductions remains in the developed regions. However, further allocation efficiency gains are still possible, and trade volumes involved are large. On the contrary, the tariff situation in the developing world is still very strongly restrictive and forms high barriers against international trade.

3.3. Non-tariff Measures

In addition to tariff related measures, various non-tariff barriers (NTB's) or non-tariff measures (NTM's) may be even more important, and their importance appears to be increasing (Bourke 1995). The NTM's can be defined as government laws, regulations, policies and practices that either protect domestically produced products from the full weight of foreign competition, or artificially stimulate the exports of particular domestic products.

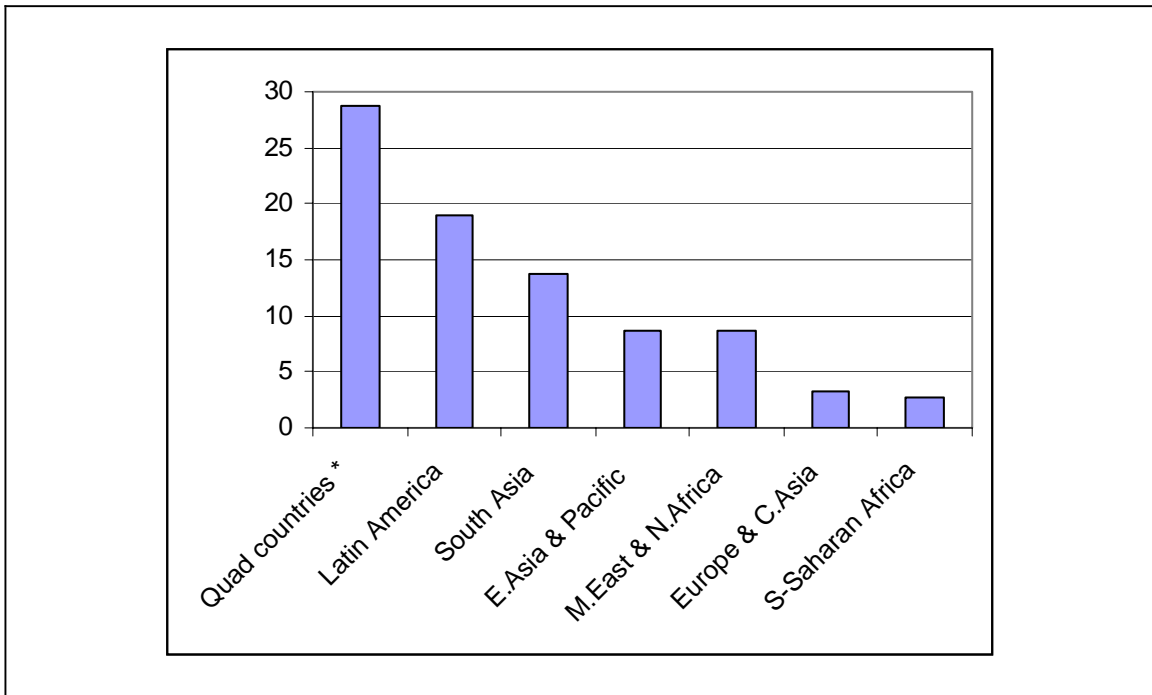
The NTM's include both formal institutional measures designed to restrict or distort trade patterns, and other restrictions that act as impediments to trade. Even if incidence of NTM's is still high, some evidence indicates that at least regional reductions took place in the 1990s (Asia Pacific Economic Co-operation, APEC, 1997). However, a more recent APEC study identified that NTM's affect forestry and forest product trade in all APEC member economies.

Figures 3.40 and 3.41 illustrate recent occurrence of NTM's³⁰. Figure 3.40 looks at the situation from the point of view of developing countries exporting wood products. Figure 3.41 illustrates the situation from the point of view of developed countries, which export paper articles. Annex 2 presents the coding of UNCTAD for measures of trade control measures. The annex illustrates how complicated and delicate issue NTM is.

The conclusion from the empirical investigation of non-tariff measures (NTM's) is that they are very frequent. Comparison between the NTM's, which the developing country wood product trade meets, and NTM's that developed country paper articles meet, reveals that the former have a much steeper NTM barrier to climb to have access to markets. This is especially true for developing countries trying to trade with the rich quad markets (Canada, EU, Japan and USA).

³⁰ Quad countries are: Canada, EU, Japan and USA

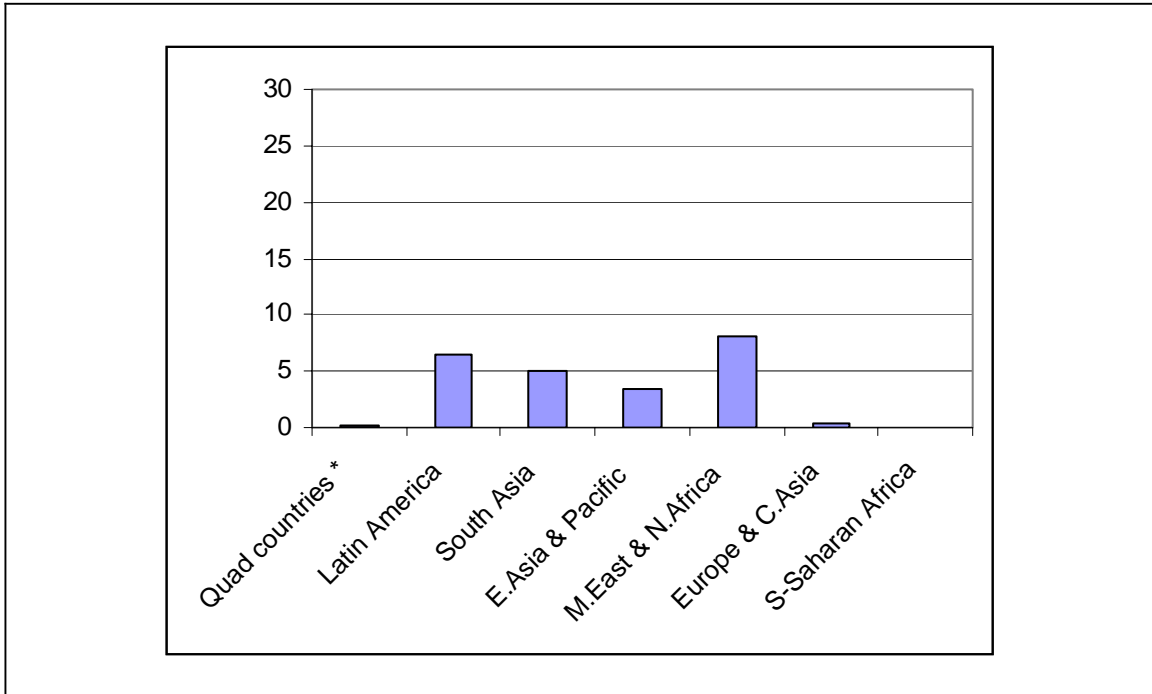
Figure 3.36 NTM's Facing Developing Country Wood Product Exports



Source: Bora, et al. 2002

[% Frequency of non-tariff measures]

Figure 3.37 NTM's Facing Developed Country Paper Article Exports



Source: Bora, et al. 2002

[% Frequency of non-tariff measures]

Technical standards and plant health standards

Technical Standards

In the discussion about the general Technical Barriers to Trade (TBT) agreement, a special emphasis here is on aspects of specific interest in relation to tropical timber. The applicability of the TBT Agreement to certification is a current source of controversy. The objectives of the TBT Agreement are (i) to ensure that technical regulations and standards are not used as disguised protectionist measures, and (ii) to reduce the extent to which technical regulations and standards operate as barriers to market access, primarily encouraging their harmonisation. The main substantive provisions of the Agreement have been summarised below (TBT Agreement, Annex 3):

- In respect to standards, products originating from other WTO Member countries shall not be accorded treatment less favourable than like products of national origin.
- Standards and the process of their preparation shall not create an unnecessary obstacle to international trade.
- International standards shall be used if they exist and are relevant.
- National standardising bodies shall participate in the preparation of international standards.
- The standardising body in a Member country shall avoid duplication of or overlap with the work of other standardising bodies in the national territory or of international or regional standardising bodies.
- Every effort shall be made to achieve a national consensus on standards.
- The standardising body shall specify standards based on product requirement in terms of performance rather than design or descriptive characteristics.
- At least every six months the standardising body shall publish a work program on standards under preparation or adopted. The titles of specific draft standards shall, upon request, be provided in English, French and Spanish.
- Before adopting a standard, the standardising body shall allow a period of at least 60 days for the submission of comments on the draft by interested parties.
- Upon request, the standardising body shall promptly provide a copy of draft standard, which has submitted for comments.

TBT agreement sets out procedures to ensure that technical regulations and standards, including packaging, marking and labelling requirements, do not create “unnecessary obstacles to international trade”. The TBT seeks to ensure that product standards are not used as disguised protectionist measures, and to reduce the extent to which they act as barriers to market access.

The text of the TBT Agreement is not very explicit as regards its coverage and application to voluntary labelling programs based on non-product related PPMs. There are two aspects to this issue: (i) Whether standards or regulations, that distinguish between products, based on non-product related criteria, such as PPMs, are covered by the TBT Agreement. (ii) Whether certification and labeling schemes, related to forest products and services, are motivated by protectionist intent or constitute arbitrary discrimination.

The TBT Agreement deals with two types of possible barriers to trade: (1) Technical regulations refer to “product characteristics or their related processes and production methods, with which compliance is mandatory”. (2) A standard is “approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory”. As certification of forest management is usually a voluntary activity, the TBT provisions on standards would appear to be relevant.

Plant Health Standards

Sanitary and phyto-sanitary (SPS) measures are used to guarantee that the producer has been capable of cleaning, sanitising, sterilising or by other means to render the offered commodity free from unwanted dirt, seeds, pests or germs. Standards in relation to plant health are generally acknowledged as legitimate, since introduced pests and disease can have devastating effects on the health of domestic forests. However, the complexity and severity of the requirements and the manner in which they are enforced may have such substantial effect on trade that they are interpreted as obstacles to trade by exporting countries. Exporters also perceive costs associated with conforming to phyto-sanitary rules as being non value adding compared with other “fitness for purpose” requirements such as kiln drying or preservative treatment.

In general, alien species are one of the greatest threats to bio-diversity and they can be one of the biggest hidden environmental costs of trade. Alien species are also a significant threat to forest bio-diversity (U.S. Congress 1993). Introduction of pests into North America has infested the American chestnut and elm. An introduced pest is currently causing serious danger to North American populations of white pines.

Regulatory requirements related to sanitary and phyto-sanitary measures have been put in place to address this problem, including several unilateral and bilateral plant protection agreements (starting with the 1951 Rome Convention, UNTS 150/67, as amended). In many countries these are being tightened and becoming more demanding, especially with regard to non-wood products (*e.g.* medicinal plants, spices and food) and other products like softwood timber. Regulations concerning heating (or kiln drying) of sawn softwood coming into the EU market from outside the region have been in place to control the introduction of pine nematode. There does not appear to be any serious cases on this issue, which would be specifically related to tropical timber.

Protective measures of SPS type are regulated under the WTO Agreement on Sanitary and Phyto-sanitary Measures (SPS Agreement). Although some trade distortion is caused as a result of such national regulations, they are not usually unreasonable controls, since their enforcement is essential for health and safety reasons (Iqbal 1995). The SPS Agreement states that such regulations should not become unnecessary barriers to trade. It requires that any sanitary or phyto-sanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, and is based on scientific principles and sufficient scientific evidence (Art. 2.2). Although there is a presumption in favor of using international standards, countries may take stricter measures if there is a scientific justification or as a result of a prescribed risk assessment (Article 3(5)). For the time being, it is not foreseen that the SPS issues would emerge as a serious constraint to market access of tropical timber.

Conclusions on market access issues and forestry

- ❑ “The practice of tariff escalation biases exports towards unprocessed resource-based commodities, characterised by low value added. This may cause difficulties to commodity-dependant developing countries in their efforts to diversify their export base...the extent of tariff escalation remains significant” (UNCTAD, 2003).
- ❑ The environmental concerns of the international community, including those who trade in forest-based products and services, need to be expressed through other instruments, in addition to the MEAs. A large variety of platforms exist to express those concerns. The national instruments are in the form of environmental policies, which again are to a varying degree reflected in the forest policies and national forest sector plans, and forest governance. Stakeholders, such as forest industry, can improve their implementation by following management plans, guides of utilisation and codes of practices.
- ❑ In the end, lots of concerns of the general public, the environmental movement and consumers are left with the “voluntary” measures, which include criteria & indicators as well as certification & labelling. Local governments are reflecting the voters’ attitudes more easily than national governments, and are introducing legislation on procurement from sustainable and legal sources. Some governments are entering into bilateral agreement and formulate pairing arrangements to tackle the environmental concerns. The international Forest Law Enforcement, Governance and Trade (FLEGT) process is taking the promotion of these principles to regional level.

- International trade instruments have varying degrees of discriminatory effect towards developing country trade. The international legal regime is quite neutral, in principle. The NTMs can be more severe towards developing country exports. However, the most difficult obstacle may be in the form of the voluntary measures, such as (i) certification and labelling, (ii) local government procurement rules, and (iii) meeting the other “sustainability and legality” requirements.
- To summarise: at least three groups of market access measures still have a major negative impact on market access of developing country forest-based trade: a) tariff escalation, b) high rate of NTM occurrence, c) increasing frequency of “voluntary”, “soft” but very sticky barriers.

3.3.5 Summary: Trade Liberalisation and Sustainable Forestry

GATT Negotiation Rounds and Tariff Liberalisation

The Uruguay Round of GATT, completed in 1994, reduced most import tariffs on industrial products by one-third in the period of 1994 to 1999. Tariffs on some products, including pulp and paper, would be eliminated completely in major developed country markets before the year 2005. Also tariff escalation was considerably reduced. Developed countries set bounds on all their tariffs, while developing countries did the same for 65% of their tariffs. As well, much attention was paid on non-tariff barriers, subsidies, countervailing duties, technical barriers and standards.

Based on Uruguay Round, tariffs on most forest products would be reduced by 33% on trade-weighted basis. Austria, Canada, EU, Finland, Japan, New Zealand, USA and several other major importers agreed to tariff elimination on pulp and paper. These countries would reduce their (1986) tariff by 50% by year 2000, and eliminate them by 2004. The major developed countries were also committed to reducing tariffs by 50% on solid wood products in period 1995-2000. For developed countries the average tariff on forest products (wood, pulp, paper and furniture) would be reduced from 3.5% to 1.1% (Barbier, 1996).

The Uruguay Round committed all major developed countries and a high proportion of developing countries to binding tariff rates on forest products, thus reducing market risk. For non-tariff barriers, the Agreement on Sanitary and Phyto-sanitary Measures and the Agreement on Technical Barriers to Trade would improve market access. Nevertheless, while the Uruguay Round reduced tariffs significantly, its implications for the non-tariff barriers was less clear. (Barbier, 1999).

Boyd, *et al* (1993) found that due to the US tariff removal on the North-American sawnwood trade, Canadian sawn softwood exports to USA would increase by 4.5%. After the 1994 Uruguay Round, FAO made several assessments of its effects on world agriculture, forestry and fisheries. Barbier (1996 and 1997) contributed to the forestry part of this work. He found that the Uruguay Round would increase the world imports by 0.4-0.5%. Brown (1997) found that gains of trade due strictly to the Uruguay Round would be relatively small also for Asia-Pacific countries.

Effects of the tariff reduction have been researched through a global partial equilibrium model (global forest products model, GFPM, see “Accelerated tariff...”). Further, both local and global effects have been analysed (Brooks *et al.* 2001). The conclusion of Zhu *et al.* (2002) includes that the effects of ATL on trade would be much more important than on consumption and production. The simulation results indicate that the roundwood trade would decrease by about 5.5% on global level under ATL. As expected, the world trade in manufactured products would increase by 5-6%.

Accelerated Tariff Liberalisation Proposal and Simulation Results of Impacts

Even in some industrialised countries, tariffs on forest products (such as wood based panels) remain high. In other countries tariffs in the range 10-20% are common. In 1997 ministers of Asia-Pacific Economic Co-operation (APEC) countries called for the nomination of sectors for early voluntary liberalisation (EVSL). Canada, USA, New Zealand and Indonesia proposed the forest sector.

The process led to the Accelerated Tariff Liberalisation (ATL) proposal to cover all forest products. Products included were: logs, wood products, pulp and paper. Parties to the Uruguay Round of GATT zero-for-zero agreement would move up the elimination of tariffs on pulp, paper and paper products from January 1, 2004 to January 1, 2000. Others would attempt to remove tariffs by the same date but could delay removal until January 1, 2002. (Buongiorno, *et al.*, 2003).

The simulation of tariff liberalisation with a global model produces a large number of numeric results for any chosen set of conditions. In this context it is only possible to summarise a few key results reported in the literature. Comparison of simulation results from two large models, Global Forest Products Model (GFPM) and CINTRAFOR Global Trade Model (CGTM), indicates that they produce similar results on similar assumptions (Brooks, 1999). With similar assumptions on economic development and tariff cuts, the results were: (i) No major global changes on production and consumption, (ii) significant changes in commodity composition of trade and in geographic patterns of production and trade. According to Wisdom (1999), for many countries and the world, the welfare gain of consumers would exceed the welfare loss of producers (due to trade liberalisation), but not by much. “The question of whether, in fact, they should be compensated, and if so, how, is a political question. It is a very important question (Wisdom, 1999).

According to Buongiorno, *et al.*, (2003), “To judge the environmental implications of further liberalisation, changes in timber harvest can be used as a coarse indicator of impacts on the forests. Based on model projections, aggregate global timber harvest would increase little, as compared to the base scenario in 2010. The expected change in the world timber harvest is the net effect of both increases and decreases in individual countries. Projected timber harvesting would increase most in the former USSR and South America (by about 1% on an average year) and decrease slightly in Oceania and Europe, with accelerated tariff liberalisation.”

According to Tomberlin and Buongiorno (2000) and Sedjo and Lyon (1990), increased harvest in managed secondary forests, especially plantations, is likely to account for much of the net increase in world timber harvest. Taken together, these projections suggest that, at a broad scale, further tariff liberalization in the forest sector would be neutral with respect to some high-profile environmental consequences (harvesting primary forests) (Buongiorno, *et al.*, 2003).

According to Buongiorno, *et al.*, (2003), “Further tariff liberalisation may also lead to positive environmental changes by stimulating increases in manufacturing efficiency in export-oriented developing countries. In addition, trade liberalisation in forest products is most likely only as a part of a broader set of reduction in tariff and other barriers. This may contribute to increasing income and rising standards of living in developing countries, accompanied by decreases in consumption of fuelwood and increases in consumption of other forest products – including forest amenities and attendant conservation measures – along an environmental Kuznet’s curve (Raunikar and Buongiorno, 1999).”

Single Country Case: Trade Agreements and New Zealand

It is often important to assess the potential effects of trade liberalisation on a single country. Due to the complex interactions between industrial units, domestic wood and product markets, and international linkages, it is important to have an analytical framework that allows for a whole range of trade flows to adapt to a particular scenario of assumptions.

GFPM model (see *e.g.* FAO 1997), which was used for ATL simulation above, was used to simulate impacts on a single country, New Zealand. Modifications were made to include bilateral trade flows, to allow better modelling of regional trade agreements. In addition, country parameters were set specifically for New Zealand (Brown, 1997 a,b).

Effects of three alternative scenarios were studied (Brown, 1997 a,b):

- (i) P5 agreement between USA, Chile, Australia, New Zealand and Singapore. The tariff rates of 1997, targeted for removal by 2005, are summarised in table 7.1.
- (ii) AFTA-CER between ASEAN Free Trade Association (AFTA) and Closer Economic Relations (CER) countries (Australia and New Zealand). The tariff rates of 1997, targeted for removal by differing target years, for selected commodities are summarised in table 7.2.
- (iii) GATT (1994) Uruguay Round agreement.

Impacts on Production: The simulation results from all of the three cases indicated an increase in New Zealand production of processed forest products such as newsprint and plywood (compared to no liberalisation). The regional agreement scenarios (P5 and AFTA-CER) indicated a lower roundwood production, while GATT 1994 scenario indicated stable or increasing roundwood production.

Impacts on Exports: The simulation results indicate that the impacts are greater for exports than for production. Export of processed commodities – plywood, veneer, newsprint, and printing and writing paper- increased under all three alternative liberation scenarios. Instead, the primary materials, roundwood, and pulp as well, were lower under the liberation scenarios. The global liberation scenario (GATT 1994) resulted in largest changes in exports.

Impacts on Local Consumption: According to the case simulations, all the liberalization scenarios led to moderate increase in local consumption of most products (Buongiorno *et al.* 2003). Further, the higher production led to higher fiber consumption. However, the three scenarios differed from each other in the implications of composition of consumption

In the case of New Zealand the basic objective was to increase the value added of the already expanding roundwood supply. The regional agreements, according to these case simulations, actually reduced the primary wood consumption. Instead the global liberalization scenario (GATT 1994) resulted in a moderate increase in roundwood consumption. Thus, only global scheme was open enough for primary supply expansion.

Table 3.9 Tariff Rates of 1997 Targeted for Removal by 2005 in P5 Countries

		Tariff rate (%)
USA	Plywood and veneer	5.0
	Particleboard	0.8
	Fiberboard	0.6
	Printing and writing paper	1.5
	Other paper and paperboard	2.4
Chile	Industrial roundwood	11.0
	Sawnwood	11.0
	Plywood and veneer	11.0
	Chemical pulp	11.0
	Newsprint	11.0
Australia	Sawnwood	5.0
	Plywood and veneer	5.0
	Printing and writing paper	5.0
New Zealand	Sawnwood	8.0
	Particleboard	7.5
	Fiberboard	6.5
	Newsprint	7.5
Singapore	All products	0.0

Table 3.10 Tariff Rates of 1997 Targeted for Removal by AFTA-CER Countries

		Tariff rate (%)	Target year
Indonesia	Sawnwood	10.0	2010
	Plywood and Veneer	20.0	2010
	Wastepaper	25.0	2010
	Printing and writing paper	15.0	2010
Laos	Industrial roundwood	2.0	2015
	Sawnwood	5.0	2015
	Plywood and veneer	20.0	2015
	Chemical pulp	3.0	2015
	Newsprint	10.0	2015
Malaysia	Plywood and veneer	40.0	2100
	Newsprint	5.0	2100
	Other paper and paperboard	20.0	2100
Thailand	Sawnwood	5.0	2010
	Plywood and veneer	20.0	2010
	Chemical pulp	7.0	2010
	Newsprint	35.0	2010
Australia	Sawnwood	5.0	2005
	Plywood and veneer	5.0	2005
	Printing and writing paper	5.0	2005
New Zealand	Sawnwood	8.0	2005
	Particleboard	7.5	2005
	Newsprint	7.5	2005

Core of Forest Governance from a Trade Perspective

The core of forest governance is based on: (i) National forest legislation. (ii) National forest policy. (iii) Government guidelines and instructions for forest management. (iv) National forest, environmental and conservation programs. Most of these elements are in some form in place in most countries. The issue is generally not that the rules would be missing or inadequate, but often there is a lack or insufficient implementation, monitoring and enforcement.

The core of tropical forest governance is enveloped in a number of “softer” or more distant elements, which include: (v) Mechanism of monitoring and evaluation (M&E) (*e.g.* criteria and indicators for sustainable forest management (SFM). (vi) Voluntary measures (*e.g.* code of logging practice, forest certification, *etc.*). (vii) Multilateral environmental agreements (MEAs). For example, use of formal M&E can be very beneficial for controlling the efficiency and effectiveness of the sector, but management and implementation capacity itself becomes easily a bottleneck.

Even if the ecological conditions are different, the challenges of good forest governance are mostly similar in temperate and tropical forests. Key objectives, such as sustainability are the same. Techniques to achieve sustainability naturally differ. The need to render the global forest governance under the same umbrella was recognized by UNCED in its “Forest Principles” in 1992.

Technically, the prerequisites for good forest governance are in place in many areas of the temperate and boreal region. But as is the case with tropical forests, the commitment and success of implementation and enforcement varies. When the key problems in temperate and boreal forests are: forest fires, alien species, atmospheric pollution impacts, orientation and control of small-scale private forest owners, *etc.*, the problems in the tropics include land use changes and deforestation.

Complementary Instruments

As the international environmental conventions and the trade agreements do not cover the whole subject matter of tropical forestry, or do not apply to the specific conditions, a number of complementary measures, often voluntary, have been introduced.

Certification is here given as an example of such “soft” policy instruments (Bass & Simula 1998). Certification has typical characteristics of an instrument, which may complement the range of legal instruments and become a valuable part in the process of convergence towards effective and efficient tropical timber regime. There is a long-standing policy debate over whether governments should be involved in certification.

Policies on Environment and Development

A large number of other policies have a potential impact on the market access of tropical timber. Aggressive development policy, with high growth targets, may liquidate the tropical timber resource base in a manner, which may not be consistent with the sustainability or conservation goals. The overall issue is the internal consistency of the range of policies in terms of their impacts on tropical forests. Land use policies, regional, national and local development policies, industrial policies, fiscal policies and investment policies are among the components, which should be formulated in a manner not conflicting with the sustainability targets.

Linkage of Forest Products Trade and Forest Management

Trade can have impacts on forests through two main channels: 1) through physical volume impacts due to increased harvesting demand for net exports, 2) through economic effects in the form of factor income.

In general, increased net export of forest products of a country increases (or increased net import decreases) the demand for wood raw material. In principle the effect is similar to the impact of increased domestic demand of similar forest products (product mix, however, is usually different).

The increased trade (net export) effect will usually increase the harvesting intensity of the local forests. The size of the effect depends on exact composition of the trade increase, and respective conversion rates of the industrial processes. In addition, the type of cutting is related to the quality of raw material requirements.

To summarise, the volume effect of the trade is related to the basic question on sustainable quantitative wood supply with wood type quality constraints. As such the trade impact is not intrinsically different from domestic impact. The supply response comes primarily as a short-term reaction (typically higher volume and higher price) and secondarily as a long-term supply response. Especially the latter is very intimately related to the sustainability question, and needs a support from a consistent and effective policy for SFM implementation.

The (increased) trade pull effect may be reflected in higher domestic harvesting volumes (and possibly higher log prices). The immediate issue is the maintenance of sustainable levels of harvesting even as short-term gains are possible. The related political issue is if constraints of sustainable land-use and environmental services are maintained.

The extraction of timber or other forest product related for trade can generate important trade income. The income may have positive macro-economic effects: income, employment, balance of payment, and multiplier effects.

From the point of view of trade impact on SFM, the key issue is what happens to the factor income of forest: stumpage, royalty, resource rent, or the financial value of the forest products at the level of forest itself. Ownership, tenure and legacy issues are related to the necessary pre-requisites of economic benefit to forests, or their owners as well as dwellers and people in nearby rural areas.

In case that the necessary requirements are in place to generate value from trade, and to channel it to the economy and to the forestry, a part (but not all) of the important objectives towards SFM have been reached. In a functional SFM, the forest owners get fair resource income from trade, including such government which has implemented a system of effective rent capture and revenue collection. Of course there are a number of hurdles on this way. The opposite case is if the operations are illegal, and the whole value is dissipated, *e.g.* to foreign or corrupt interests.

The trade effects on SFM can usually be improved by a number of measures. On the forestry side, the SFM measures are similar to the measures in a fully domestic operation. As closed economies are more of an exception in an era of open global markets, there is a pressure towards harmonisation of local national measures. On the trade side, there are a large number of issues and parameters, which can improve the conditions for SFM.

The volume effect is obvious: as long as a dedicated production forest base is under-utilised, any impacts from increased net exports will be positive (assuming that SFM conditions, among others, are met). In such conditions, any restrictions such as local or foreign government interventions, which act as barriers or impediments, cut into the potential welfare.

Elimination of market access constraints can have their impact through allowing a higher utilisation of domestic potential supply. In addition, more open market access can improve the total trade income by eliminating unnecessary cost. The elimination of cost in a competitive market place typically lowers the prices for consumers (at least in local and global competitive markets). In so doing, the consumer's welfare is increasing. But at the same time, elimination of unnecessary cost can increase the producer's welfare as well.

The final scene in the act is played in the forest sector itself. If the trade liberalisation, barrier elimination and trade facilitation increase the potential factor income of forestry, it is the matter of the capacity of the sector to negotiate a fair share and reap the financial harvest through stumpage, concessions, contracts, revenue collection and financial management.

The long-term sustainability is related to the sector's performance in re-investing a fair share of the (highest potential factor income) in the spirit and practice of SFM.

3.4 Market Development of Wood and Wood-based Products

3.1.8 3.4.1 Distribution and Dynamics of Forest Product Markets

Shifts in supply and demand

The drivers, which continue expanding the required volume in forest based commodities, include the following:

- Increasing global demand for a wide range of commodities and services
- Decreasing barriers and impediments, which open markets for competition
- Increasing share of production entering international trade
- Increasing domestic demand for wood raw material
- Increasing domestic demand for wood based fuel for energy
- Increasing demand for services, such as carbon and bio-diversity

The drivers, which continue increasing the value added, and simultaneously decreasing the relative value of basic production from natural forests, such as in the tropics, include the following:

- Decreasing real prices of commodities at consumers
- Increasing relative costs of such components as labour and energy
- Increasing competition from plantations
- Best available technology gets transferred through investments
- Foreign direct investments are channelled to best opportunity areas
- Illegal harvesting and trade, without compensation to forestry

To summarise, the factors above make small, export dependent countries especially vulnerable. Especially developing countries, which depend on exports, can only maintain the real export income level by increasing volumes. This puts extra burden on maintaining the sustainability of forest management. Only a well-developed forest governance system can successfully balance the trade impacts and SFM.

The attempt of the quantitative data analysis was to capture the overall shifts in the markets. The prices were ranked in increasing order and cumulative trading volumes were calculated. The results have been plotted in these figures. As the volumes and prices both react to demand and supply shifts, this was used as a method to visualise the overall shifts in the market. In these figures, the total annual sales value (at importers) is represented by the area under the curve.

The overall impact of above-mentioned drivers can be observed in the market shifts in several forest-based products. As was stated above, it is likely that the natural forests, especially export-dependent tropical forests, are especially vulnerable to such global market shifts. Figure 3.38 illustrates this type of global phenomenon. The market demand for roundwood was growing strongly in the 1980-2002 period, and traded volume was expanding during that period, it did so at the expense of prices.

Figure 3.38 Shift in Roundwood, Tropical and Non-tropical, 1980 to 2002

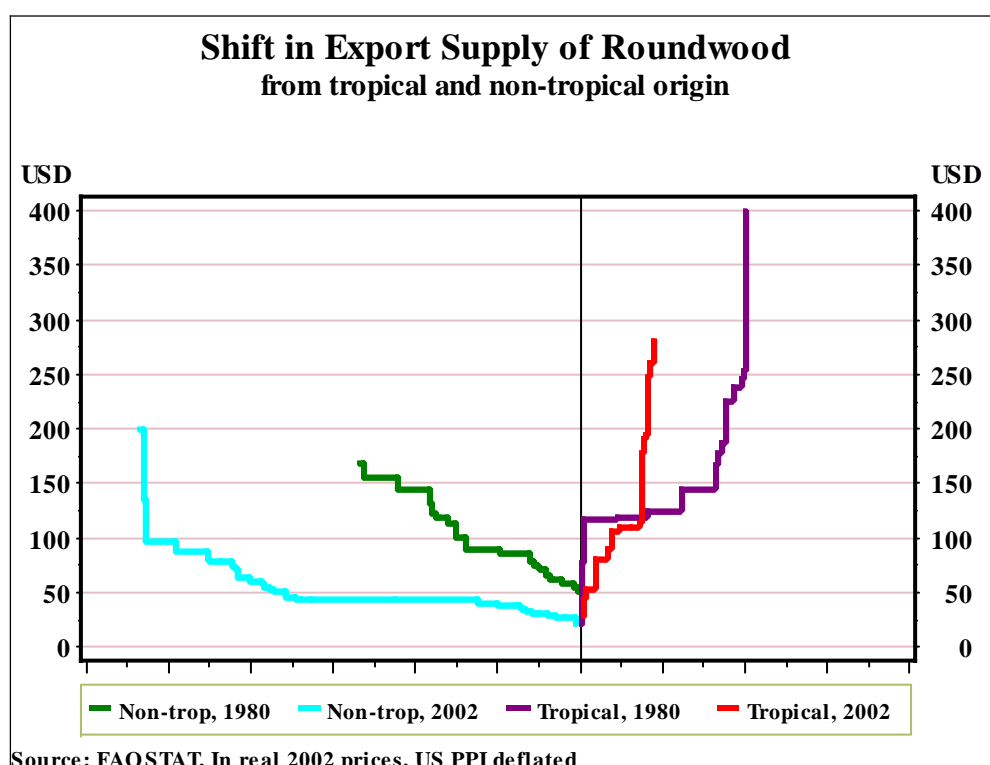


Figure 3.38 illustrates how the global export supply of roundwood has been growing, rather dramatically, by 30 million cubic meters by volume, while the real price (in 2002 USD) has dropped very strongly. The overall shift has been divided into tropical and non-tropical components. Tropical is getting more scarce but not more expensive, while non-tropical is expanding and getting clearly less expensive.

Figure 3.39 illustrates how the global export supply of sawnwood has expanded. The expansion has mostly taken place in the non-tropical (mostly softwood) markets. New efficient sawmilling capacity has emerged typically at the supply price levels of USD 160-180 per cubic metre of sawnwood.

Figure 3.40 demonstrates how the global export supply of wood based panel has expanded. This has taken place both in tropical and non-tropical producer countries. The tropical expansion is very particular, as the supplies have expanded at almost homogenous supply prices, indicating a major boom in relatively similar conditions.

Figure 3.39 Shift in Sawwood, Tropical and Non-tropical, 1980 to 2002

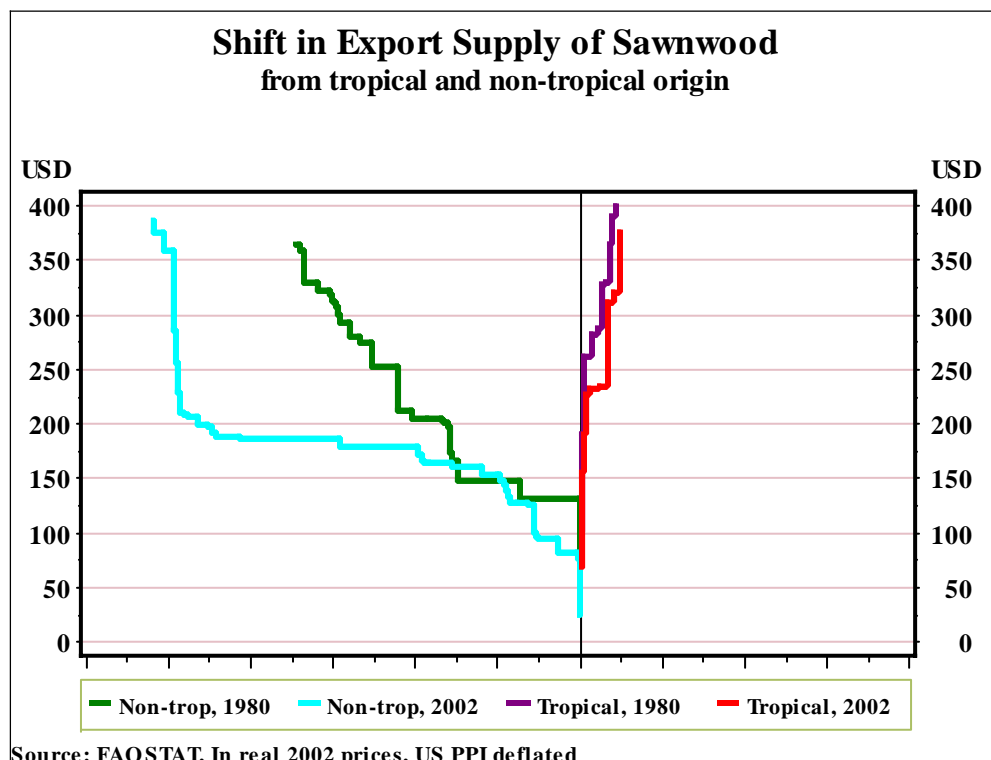
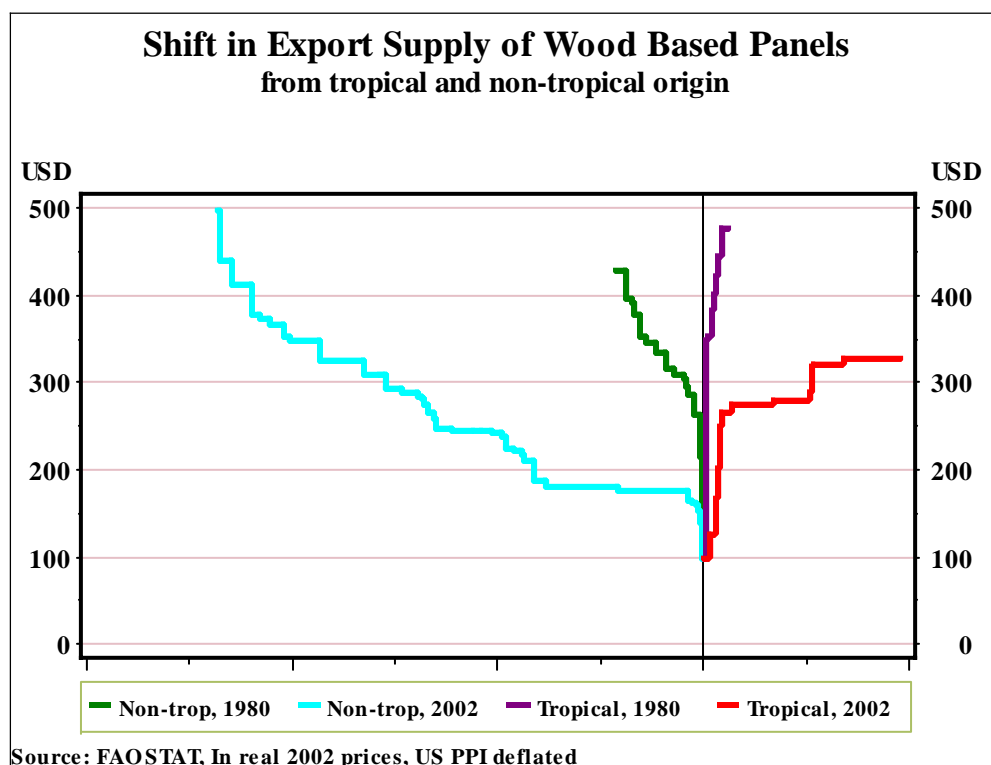


Figure 3.40 Shift in Wood Panels, Tropical and Non-tropical, 1980 to 2002



Changes in directions of trade

Table 3.11 Change in Directions, Tropical sawnwood 1996 to 2000

1000 cum	Exporter														TOTAL	
Importer	Belgium	Cameroun	Congo Rep.	Cote d'Ivoire	Hong Kong	Myanmar	Indonesia	Philippines	Malaysia	Brazil	Honduras	Bolivia	Ghana	Cambodia		
Netherlands									22							22
Spain		43								22						65
France		34						108		75						217
Belgium		38							127	26						191
Hong Kong																192
China					85			72	120	131	24					360
Italy		78		91				-153								16
Others	112	155	70				536		53	-293	-126	-79				428
Thailand						137		-33	-624	-67						-655
Korea							29		-199							-170
Philippines									-26	-57						-83
Taiwan								-48	-51							-99
Japan								-167	-193							-360
Malaysia								-137								-137
U.S.A.									-60			-22				-82
Germany									-51					-99		-150
U.Kingdom										-49						-49
TOTAL	112	348	70	91	85	137	300	27	-751	-319	-126	-101	-99	-68		-294

Table 3.11 illustrates the changes in directions of trade, which have occurred in the period 1996 to 2000. The expanding trade flows have been highlighted in green colour, and decreasing flows in pink colour. In the middle remains an area, which is the most turbulent. These are the flows, where otherwise expanding exporters make an exception and reduce their trade to those particular destinations. And it includes importers, which otherwise expand their overall imports but for some reason decrease their buying from particular source countries.

Changes in sensitive and dynamic markets

Chinese Markets

China has increased its wood imports very fast during recent years, especially in 1999. In the year 2000 China already imported more than 13 million m³ of logs, of which 6.4 million m³ of softwood logs and 7.2 million m³ of hardwood logs. Tropical log imports were at 6.1 million m³, or 85% of the total hardwood log imports. The tropical log imports to China continued increasing in the year 2001, reaching 7.3 million m³. Thus the tropical logs have had an excellent market performance in China.

The patterns of Chinese consumption of imported raw material and semi-processed materials (such as sawnwood) are explained, in part, by China's expanding exports of wood products. So, it is important to note that an important share continues to third markets in the form of value added products.

In 2000 China imported 3.1 million m³ of hardwood sawnwood. Almost 2.0 million m³ of this volume was tropical, the remaining 1.1 million m³ was from temperate and boreal sources. In the period of 1997-2000 tropical sawnwood maintained its market share (at 62-64%) in the Chinese imports. This does indicate competitiveness of tropical sawnwood in the Chinese import markets, and likely non-existence of high barriers or impediments to market access.

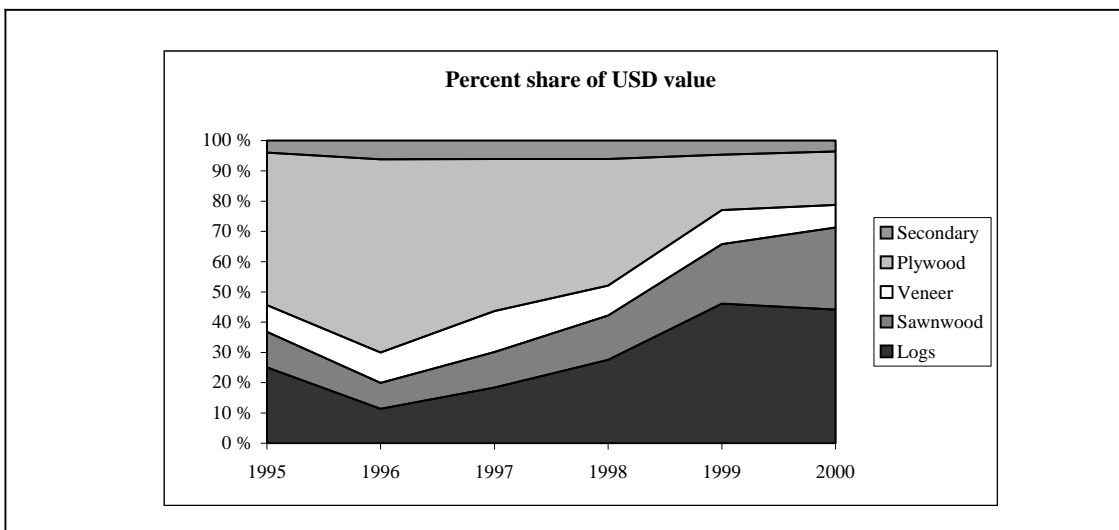
Figure 3.41 illustrates the Chinese tropical timber imports by value share. The value shares show a dramatic decrease in the degree of processing. Logs in 2000 make over 40% of the total value of Chinese imports of tropical timber. Other primary processed timber products make over 50% of the import value, the value of SPWP is under 5%.

As illustrated in the previously, the tropical (and developing world) trade has been fluctuating widely both due to global economic cycle, and in terms of its relative market share. Some of the main reallocations of

the forest product trade from developing countries have taken place in Asia. After a very strong expansion of Asian plywood and sawnwood capacity and exports, the importers relative shares have changed as well. Mainly China has increased its share while the largest importer, Japan, has decreased its imports somewhat.

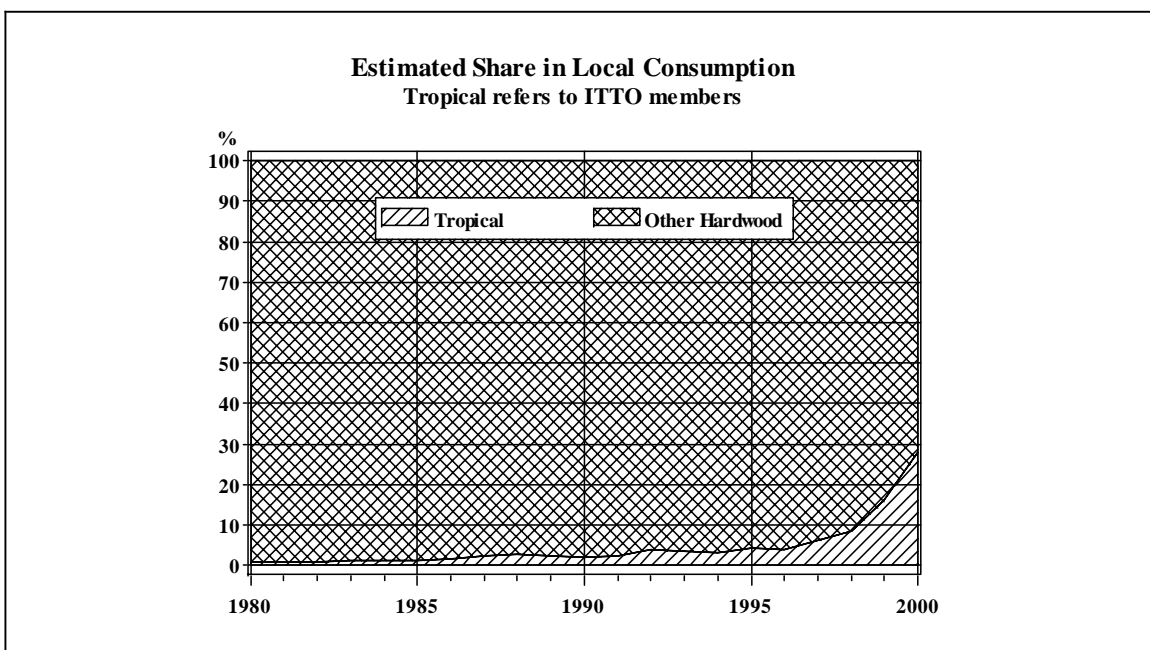
Figure 3.42 illustrates the development of the share of tropical sawnwood in the hardwood sawnwood consumption in China. The tropical sawnwood has been a very small player in China, until recently. The consumption share of tropical sawnwood increased slowly until 1996, after which the tropical share increase dramatically, from under 5% to almost 30% of hardwood sawnwood consumption. Figure 3.43 illustrates that the increase in the Chinese imports of plywood has not been covered by all sources in a similar manner. Instead, the share of tropical plywood has decreased, while plywood from other sources has increased its share.

Figure 3.41 Value Shares of Tropical Wood Products in Chinese Imports



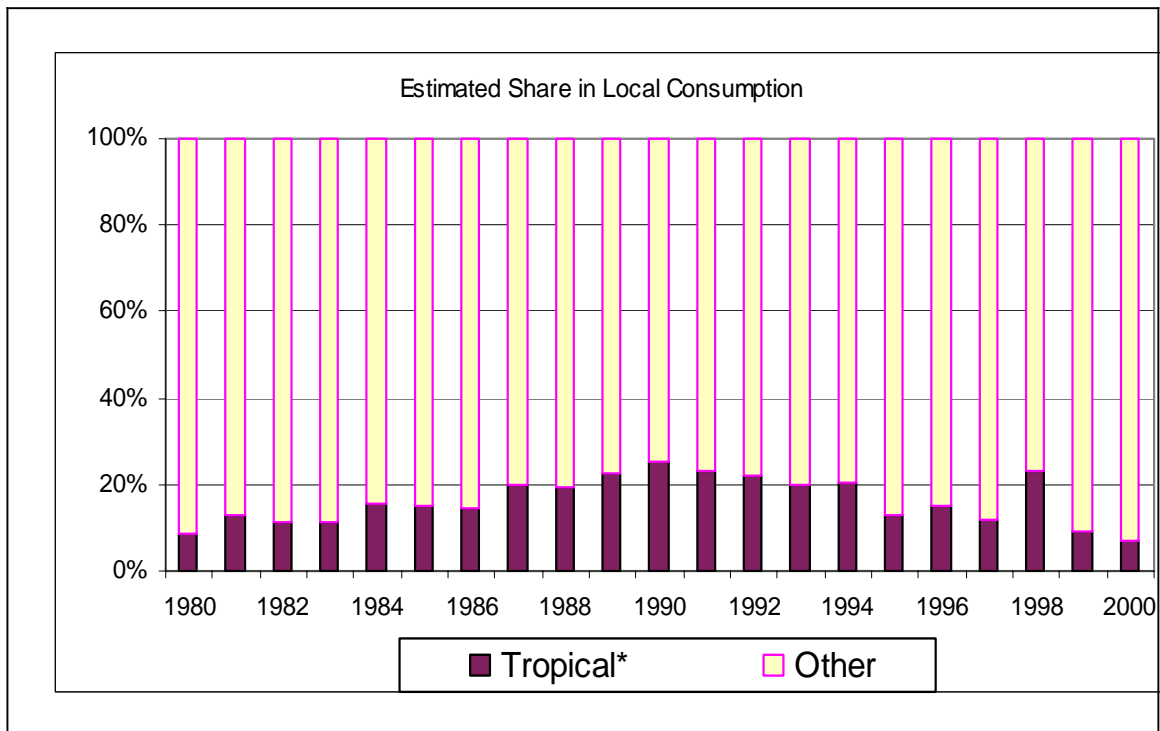
Source: Annual Reviews and Assessments, ITTO 1996-2001

Figure 3.42 Tropical and Other Hardwood Sawnwood in China, 1980-2000



Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates

Figure 3.43 Shares of Tropical and Other Plywood in China, 1980-2000



Source: Annual Reviews and Assessment of ITTO, FAOSTAT, consultant estimates

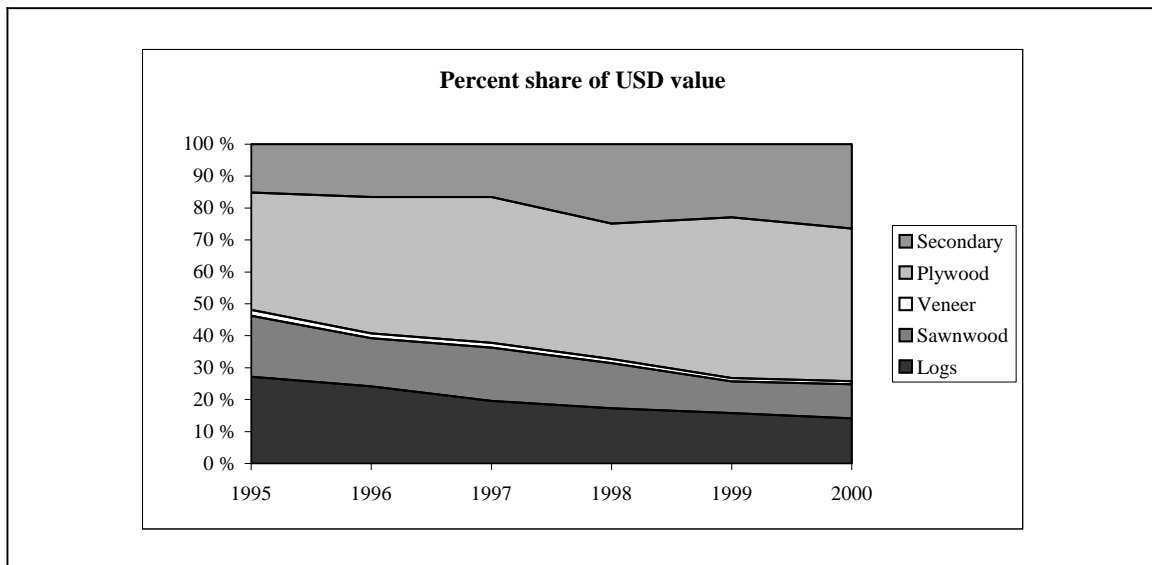
Japanese Markets

Figure 3.44 illustrates the value shares in the Japanese tropical timber imports in 1995-2000. The structural change has been quite fast. The value share of logs has dropped from 27% to 15%. The value share of plywood has increased from under 40% to 50%. The value share of sawnwood has slightly decreased to about 10%. Most importantly, the value share in SPWP has increased from 15% to 25% of tropical timber import value in five years.

The Japanese tropical log imports have declined from 5.8 million m³ in 1997 to 2.1 million m³ in the year 2001. Tropical sawnwood imports decreased from 1.1 to 0.6 million m³ in the 1997-2001 period. Tropical plywood imports to Japan have remained on a high level (4.8 and 4.5 million m³ for 1997 and 2001, respectively).

Temperate and boreal hardwood logs have maintained an important and stable import market in Japan, varying in the range of 0.4-0.6 million m³ in 1997-2001. As the tropical log market has declined, the relative share of temperate or boreal hardwood logs has increased from 9% in 1997 to 18% of hardwood log imports to Japan, in the year 2001.

Figure 3.44 Value Shares of Tropical Wood Products in Japanese Imports



Source: Annual Reviews and Assessments, ITTO 1996-2001

The analysis of temperate and boreal hardwood sawnwood development is somewhat difficult, as the statistics tend to differ. However, the indications are that the temperate and boreal hardwood sawnwood has maintained its markets quite well, while the tropical hardwood sawnwood market has declined in Japan since the year 1997. In the hardwood plywood markets, the role of temperate and boreal hardwoods is almost negligible in Japan.

In conclusion, the part of the Japanese sawnwood and plywood production, which uses temperate hardwoods, has been declining, but more slowly than tropical log based production. The consumption and imports of temperate hardwood sawnwood and plywood seem to have maintained their levels rather well in 1997-2001. The structural adjustment in the past decade has not been as drastic as that of tropical sawnwood and plywood trade. In tropical plywood, the competitive edge has clearly shifted and stayed with tropical supplier countries.

3.1.9 3.4.2 Consumer and Distributor Actions and Campaigns

Market abstinence: campaigns and boycotts

Campaigns and boycotts are tools to encourage consumers to abstain from the purchase of products not deemed to meet certain legal, environmental and social criteria. Campaigns are issue-based plans of action aiming to raise consumer and government awareness of perceived injustices and players not meeting their global environmental obligations. Campaigns use many tools to get their message across including publicity, dialogue through policy processes, and petitions. The fundamental objective of consumer boycotts is to restrict consumer demand for the boycotted products to an extent that imposes economic hardship on the producer. The boycotting group hopes to induce the producer to change their behaviour and often, to influence policy decisions in both the public and private sector. Greenpeace activities for the promotion of SFM include campaigns for example against:

- Germany's biggest public bank to protest against rainforest destruction and contamination caused by German investment in an oil pipeline that runs through Ecuador's Amazon rainforest.
- Danish-owned companies which continue to import timber products from Liberia calling for the public to send letters of halt the import.
- Dutch companies to stop the imports from Cameroon of timber products, which are thought to be illegally logged. Furthermore, in June 2003, Greenpeace has called for a boycott of all timber products originating from Indonesia in response to the high levels of illegal logging known to be occurring.

Box 3.2

The Impact of Consumer Boycott – Experience from Ghana

A study on the impact of European consumer boycotts on the timber industry in Ghana has shown that over three-quarters of the managing directors of 52 sawmills believed that the boycott was responsible for, or contributed to reduced demand for tropical hardwoods in Europe. Part of the reason for this perception is that producers felt they could influence or be involved in discussions relating to national issues impacting trade, such as forest policies whereas for international boycotts they feel powerless to enter dialogue, they can merely react rather than participate in decision-making processes. They also felt that environmental groups oversimplify the issue of deforestation by over-emphasising the role of the timber industry and virtually ignoring other factors such as high population growth rates, low per capita outputs, inequitable land tenure systems, low soil fertility, shifting agriculture, and demand for fuel wood. Therefore, it was felt that it is difficult to enter dialogue with environmental groups and seek lateral solutions looking for demand from other markets or increasing the efficiency of the tropical hardwood. One of the tangible impacts of the boycott was delayed and reduced capital investment in more efficient technologies, which is ultimately to the detriment of sustainable forest management.

Despite raising awareness of some critical issues, and influencing consumer behaviour, boycotts and campaigns can influence the ability of those targeted to respond to such criticisms and indeed may have an adverse effect on SFM.

It is almost impossible to definitively extract the trade impacts of boycotts, from the many other market factors. One of the effects of a boycott, and perhaps intentionally so, is the reduced economic potential of forests. Lowering incomes reduces incentives to protect and manage tropical forests, which results in increased rates of deforestation as the land is converted to more profitable uses. Without other incentives, this is very much the case in developing countries with little access to capital. NGOs such as WWF are increasingly recognising the devaluing effects of boycotts on forests in developing countries and are looking to more positive incentives, such as certification, to value sustainable forest management.

Retailer and wholesaler actions

The verified commitment to and system of improvement is designed to allow enterprises working towards certification to gain access to the market, providing an incentive. This is already bearing fruit – B&Q in the UK is already willing to consider buying wood products from members of the TFT despite a very strict preference for FSC certified products in its Timber Buying Policy.

The promotion and support for step-wise approaches links closely to the issue of legality of timber. Many countries are beginning to look for ways of differentiating and excluding illegally produced timber from entering. The first step in verification of progress towards SFM is to prove legality – otherwise there is no point an enterprise going forward to invest in SFM, and potentially no way of getting wood imported. An independent verification of legality is clearly attractive, even though no actual product label is likely to be possible.

Buyers and trade supporting producers: A *Buyer's Group* is a network of companies and organisations all committed to an agreed vision or set of principles which influences how they buy (and sell) products. WWF has been actively working in partnership with governments and private sector, particularly in the large producing and consuming nations, to help create demand and supply for sustainably managed forest products, through its the Global Forests and Trade Network (GFTN). The Network includes over 800 companies in 19 countries committed to producing, trading or purchasing certified timber and products and is thought to be responsible for more than half of the demand for certified products.

For example, WWF has recently joined forces with IKEA in a three-year program, carrying out forest projects that will contribute to the development of global toolkits on forestry issues and promote responsible forestry in Russia, China, Romania/Bulgaria and the Baltic countries. The GFTN is partway through a study to see how they can make the step-wise approach work.

The concept of Producer Groups is as a network of producers and other organisations, which can support each other in a common vision towards improved production methods (i.e. SFM). The WWF's GFTN includes producer groups as well as buyers, and aims to help create markets for legal certified timber, through improving both supply and demand.

At present WWF/GFTN supports the FSC certification scheme, as the only credible form of forest certification. However, it recognises the role of other certification systems and there is scope for change through the process being undertaken to seek dialogue and assess which other schemes meet FSC standards.

Whilst not a buyers group, an influential group affecting buyers decisions is the US-based Good Wood Alliance which compiles and annually selective list of suppliers from both certified and non-certified sources.

Other initiatives include the TFT, which brings together traders and producers of tropical timber in its membership. It actively promotes a supportive approach between the two, with several examples of producers working to support producers in order to get a certified timber supply. The TFT embodies a pragmatic approach, and also supports the emergence of step-wise certification.

There are also individual examples of buyer companies supporting development of their suppliers. Finnforest has an initiative in which they are working directly with an Indonesian supplier on developing their standards of practice. They see this as a way of avoiding trade barriers (such as boycotts of Indonesian timber proposed by NGOs and indirect barriers of them not being certified), whilst ensuring they reach targets and commitments for trading sustainably produced products. They are also looking at similar arrangement with suppliers in Brazil.

This is a commonly emerging story – buyers are now realising that to sustain their supply line they need to invest in and support it. The rapid development of the TFT also demonstrates this trend. Whilst this trend is encouraging, it is important to note that it is typically only happening for supply-short products (i.e. tropical timber) – there is no evidence of such support to smaller producers for example in the UK.

3.1.10 3.4.3 Criteria and Indicators for Sustainable Forest Management

Developments in forestry over the past decade have focused on progress towards sustainable forest management (SFM), an approach that encompasses environmental, economic and socio-cultural objectives of management in line with the “Forest Principles”. These were adopted at the United Nations Conference on Environment and Development (UNCED) in 1992 and the proposals for action adopted by the Intergovernmental Panel on Forests (IPF) and the Intergovernmental Forum on Forests (IFF). The specific toolbox developed to describe and help monitor progress (or lack of it) towards SFM, in particular at the national level, is called criteria and indicators (C&I). The development of this tool within regional country-driven initiatives started prior to UNCED, by the International Tropical Timber Organization (ITTO) to demonstrate members’ commitment to achieve sustainable management of tropical forests. It has spread world wide since.

At the international level, C&I has been recognised widely, including in IPF/IFF/UNFF, ITTC, COFO, Conference of the Parties to the Convention on Biological Diversity and it has also been brought to the attention of the WTO Committee on Trade and Environment. Currently, it appears prominent among the only few common denominators in the international forest policy deliberations. It is increasingly used as a systematic tool to guide practical action towards SFM and to monitor progress. Consequently, it can also have many implications to trade, market access and certification in particular.

While international trade of forest products is regulated through WTO and regional trade agreements as well as ITTA, sustainable forest management is not. There is no legally binding international instrument on forests and international guidance to countries is provided by “soft law” means, such as the Forest Principles and proposals for action agreed by IPF, IFF and UNFF. In addition, regional political commitments to SFM guide national actions. These processes include the following:

- The Central American Forest Convention and associated Lepaterique Process on C&I.
- The Ministerial Conference on the Protection of Forests in Europe (MCPFE) and associated Pan-European Process on C&I.
- The Conference of Ministers in Charge of Forests in Central Africa (COMIFAC, also known as the Yaoundé process).

Non-tariff barriers, and whether or not certification counts as such, have not been widely discussed at WTO. Certification has been adopted enthusiastically in some quarters, notably by many environmental non-governmental organisations and also some governments, particularly in developed countries. However, it continues to be perceived by many developing countries as a trade barrier that reduces their competitiveness, in particular in Africa.

Criteria and indicators to evaluate and to implement sustainable forest management

The broad introduction of the concept of sustainable forest management can be traced to the Forest Principles and Chapter 11 of Agenda 21, adopted at UNCED in 1992. Principle 2b specifically states that:

“Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations.”

It goes on to specify that: *“These needs are for forest products and services, such as wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products.”*

And further: *“Appropriate measures should be taken to protect forests against harmful effects of pollution, including air-borne pollution, fires, pests and diseases, in order to maintain their full multiple value.”*

The concept of SFM has continued to evolve since 1992 through the international forest policy dialogue (IPF/IFF/UNFF) and a large number international and regional initiatives and meetings aimed at describing SFM, translating the concept into practice and elaborating a tool to measure progress, in particular through the C&I. C&I form a tool for assessing trends in forest conditions and forest management. They provide an implicit definition of what sustainable forest management means and a common framework for describing, monitoring and assessing progress towards SFM. C&I approach forests as eco-systems, which provide a wide array of environmental, economic and social benefits to society.

National-level criteria define the range of forest values to be addressed and the essential elements or principles of forest management against which the sustainability of forests may be assessed. Each criterion relates to a key element of sustainability, and may be described by one or more indicators. Indicators measure specific quantitative and qualitative attributes (and reflect forest values as seen by the interest group defining each criterion) and help monitor trends in the sustainability of forest management over time.

Nine eco-regional forestry processes involving 149 countries, whose combined forest area equals 97.5 percent of the total forest area in the world, have been established since 1992 for the development and implementation of criteria and indicators. Most of them meet on a regular basis to refine the concept of sustainable forest management through the development of criteria and indicators, and to follow up progress through country reporting. The nine C&I processes were established by forestry-related governmental representatives, agencies and institutions, in many cases involving NGOs. (FAO, 2003a)

Criteria and indicators have many applications, including as a framework for setting goals, facilitating and monitoring sustainable forest management and the effectiveness of national forests programmes and policies, strategic planning, communicating progress to policy makers and the public and building bridges among stakeholders (CICI 2003).

In addition to guiding national forest policy making, other areas where C&I is used as a guiding tool are forest management planning, implementation and evaluation, including operational level guidelines, model forests and forest certification. Also the IPF (1997) emphasised multiple roles of the C&I tool, including its potential to clarify issues related to forest certification and marketing of forest products even though C&I are not performance standards. (CICI 2003; Rametsteiner and Wijewardana, 2002)

The European example demonstrates the wide use of the C&I tool. The Pan-European Criteria and Indicators, developed under the Ministerial Conference on the Protection of Forests in Europe, are considered an instrument for measuring and reporting progress towards sustainable forest management in Europe as a whole. It is based on the commitments (resolutions) made at the Helsinki ministerial conference in 1993 on sustainable management and conservation of biological diversity in European

forests. On the basis of these C&I, a complementary instrument, the Pan European Operational Level Guidelines (PEOLG), was also developed and adopted in the Lisbon ministerial conference in 1998. These guidelines are designed for sub-national application at a practical level and represent a common framework of recommendations for sustainable forest management that can be used on a voluntary basis. They contain specifications for performance of forest management and were later adapted as the regional framework for voluntary national certification standards endorsed by the Pan European Forest Certification system. (Rametsteiner and Wijewardana, 2002)

The conceptual development of C&I has gone a long way since UNCED. This has taken place through criteria and indicator processes, complemented by a number of intergovernmental meetings such as the FAO/ITTO expert consultation in Rome in 1995 and the International Conference on Criteria and Indicators for Sustainable Forest Management (ISCI) in Helsinki in 1996. The process continued in the International Conference on Contribution of Criteria and Indicators for Sustainable Forest Management (CICI 2003) in Guatemala City, and subsequently as IPF/IFF/UNFF recommendations on the development and implementation of C&I.

CICI-2003 gathered representatives from all of the above processes, government officials, international organisations, including NGOs, and experts in the field. It demonstrated a much increased understanding of the issue of sustainable forest management and its potential contribution to wider issues of development and the place and role of criteria and indicators as tools for reaching and monitoring SFM with a view to improved policy and field level practices.

Indicators among the nine eco-regional initiatives vary widely owing to differences in forest types and environmental, social, economic, political and cultural conditions. On the basis of earlier recognition that the sets of criteria in all nine processes are very similar, the conference agreed – first time ever at an international forum - that SFM comprises the following common thematic areas:

- extent of forest resources
- biological diversity
- forest health and vitality
- productive functions of forest resources
- protective functions of forest resources
- socio-economic functions
- legal, policy and institutional framework.

At the global level, the future (2005) Global Forest Resources Assessment will be largely structured according to the above thematic areas, yet providing its own set of globally compatible variables. Thus clear linkages have now been established between politically defined broad goals for SFM (the thematic areas) in various regional C&I processes and the forest resource assessment (FRA) as an existing reporting process on forest resources.

National-level criteria and indicators are being complemented by the development and implementation of criteria and indicators at the forest management unit level in a number of the processes as well as by other actors such as NGOs and the private sector. The major driving force for the development of C&I at the forest management unit level is certification.

The degree of implementation of criteria and indicators at the national level varies considerably. Many countries around the world have developed their own national criteria and indicators on the basis of the regional set; collect data for indicators; and use them to report on the status and trends in their forests and forest management. This information helps guide and monitor forest policy development (national forest programmes) and management practices; and is also used for promotional purposes (such as certification); and to international reporting purposes (*e.g.* Ministerial Conference on the Protection of Forest in Europe, ITTO *etc.*).

Although the usefulness of C&I is recognised world wide, in many developed countries, action is limited by the lack of trained personnel or institutional capacity for collecting and analysing information and for following up the development and implementation of improved management prescriptions based on the information obtained.

Relationships between criteria, indicators and certification

Despite the different levels of implementation, criteria and indicators have helped clarify and build consensus on the concept of SFM. They have established a framework for monitoring process in implementation and the effect of action, which has been recognised by various forums, notably by IPF/IFF and UNFF.

Forest certification, although not yet widely applied in developing countries, is a market-based tool for third party auditing of sustainable management practices in production forests. In January 2002, the world had 109 million hectares of certified forests (2.8 % of the world's forests). Greatest interest in certification continues to come from Europe and to some extent North America. The Pan-European Forest Certification (PEFC) scheme and the Forest Stewardship Council (FSC) are the two main international certification schemes. PEFC only covers Europe. FSC, the Malaysian national certification scheme, and Kerhout are the main certification schemes operating in the tropics. (Atyi and Simula, 2002)

Setting up an appropriate relationship among SFM, C&I and certification can produce a greater commitment to forest and forest management by different actors and interest groups. For example, ITTO's C&I training and field testing showed that a major motivator for many countries/forest managers in collecting data for indicators was the desire to eventually seek certification of their timber products. (Johnson, 2001). The broad objectives of certification and C&I are identical; to promote good, sustainable management of forests. There are also many differences between these two concepts, especially regarding scale, purpose and participating actors.

The scale of C&I frameworks range from national to forest management unit FMU level. Forest certification is mainly concerned with the sub-national, particularly FMU, level. Purpose: Criteria and indicators provide a means to measure, assess, monitor and demonstrate progress towards achieving the sustainability of forests in a given country or in a specified forest area, over a period of time. On the other hand certification is a means to certify the achievement of certain, pre-defined standards of forest management in a given forest area, at a given point in time. Being a descriptive tool, C&I are not intended for assessment of the performance of forest management, whereas forest certification is based on prescriptive standards (that can be based on C&I). C&I contain no targets or performance expectations, while certification is an assessment against performance standards. Actors: While the elaboration of C&I is often led by governmental bodies, forest certification standards and systems are set up by private bodies. (Simula, 2002)

In many countries and in many certification schemes regional or national criteria and indicators have been used as the basis or starting point for certification, when developing standards or guidelines for performance at the management unit level (see Box 3.2). Many C&I based certification schemes have also taken note of the Forest Stewardship Council Principles and Criteria and made efforts to ensure a degree of compatibility. C&I based certification is driven by many forest owner, industry and government representatives, whereas many environmental NGOs representatives continue to stand behind FSC and other schemes that are based on their own principles. CICI 2003 encouraged voluntary approaches, such as certification schemes, to use criteria and indicators as a useful reference in promotion of monitoring sustainable forest management (CICI, 2003)

Box 3.3 Examples of Use of C&I in Certification

Canada (regional C&I reference: Montreal Process)

The Canadian Council of Forest Ministers has adopted national C&I that are similar to, or augment, those in the Montreal Process. These are used in national reporting on SFM, and by the Canadian Standards Association (national certification body) in its forest certification system. C&I formed the basis for the CSA's forest certification standards.

Finland (regional C&I reference: MCPFE)

A vast majority of the Finnish forests have been certified according to the Finnish Forest Certification System (FFCS). FFCS is acknowledged as part of the Pan European Forest Certification Scheme (PEFC). The national C&I were used as one of the references when a national certification standard was developed. (Parviainen and Suoheimo, 2003).

Ghana (regional C&I references: ATO and ITTO).

A National Committee on Forest Certification was established in 1996 and the Ghana Forest Management Certification Standards and Checklist were revised in 2000. ATO Principles, Criteria and Indicators (PC&I) were used as the basis for development the national standard. However, the national committee has not been active since. The ATO PC&I and the ITTO C&I were harmonised in 2001.

Malaysia (regional C&I reference: ITTO)

Malaysia can be considered as one of the leading countries among ITTO producer members in the application of the ITTO C&I. It developed C&I for national and Forest Management Unit (FMU) levels, on the basis of ITTO C&I in 1994. Malaysia has linked these closely to the forest management certification, developed under the Malaysia Timber Certification Council. The Malaysian criteria & indicators have provided the basis for the standards of performance.

**) Note that other certification systems, such as FSC, are also used in many of these countries and/or the national standards based on C&I are compatible with other schemes such as the FSC PC&I.*

Implications of criteria and indicators to trade

The international trade in wood and non-wood forest products affects sustainable forest management both positively and negatively. Difficulties in realising positive impacts from trade are related to barriers on trade liberalisation, access to market and internalisation of environment-related costs. Trade liberalisation, accompanied by sound environmental and social policies, could have positive impacts, since sustainable forest management has the potential to promote economic development, contribute to poverty alleviation and reduce environmental degradation on a long-term.

Debates on trade and SFM continue within the negotiations of a new International Tropical Timber Agreement (ITTA), implementation of the World Trade Organization (WTO) Doha Declaration, UNFF, regional trade agreements and national trade policy making. Key issues on the trade-SFM agenda include illegal trade, certification and labelling, public procurement, valuation of forest products and services, traditional forest related knowledge (TFRK), alien species, and trade in endangered species. IPF/IFF/UNFF has not as yet found a solution to increase market transparency in order to improve market access for forest products and services, including those coming from sustainably managed forests. It is worth noting, though, that during the recently started preparatory negotiations for the new ITTA, many countries have expressed their interest in including C&I in the new agreement.

As WTO does not explicitly deal with forest product trade, national issues have a greater effect on forest policy development than do international concerns. These include national forest programmes, forest tenure, sector rules, subsidies and logging bans. An example is the 10-month (in effect since 7 July 2003) ban on the import of all round logs and timber products originating from Liberia, prompted because the Government had not shown that revenue from the timber industry was used for legitimate social, humanitarian and development purposes (UN, 2003). China as a major consumer of wood, is another

example where in part due to the logging bans the country has recently shifted from timber exporter to importer. These and many other examples of logging bans clearly indicate lack of adequate measures of SFM and means to report on trends in forests and action taken.

The potential of C&I as a systematic tool to help evaluate progress towards SFM is strong, in particular after the international recognition of common thematic elements (criteria) of sustainable forest management in the CICI 2003 meeting in Guatemala. Key emerging trends that have linkages also to forest products trade include:

- Integrating criteria and indicators into national forest programmes, as recommended by IPF and CICI 2003.
- Using common thematic elements (criteria) as a structure for global reporting in global FRA.
- Using C&I as a basis or reference to set standards in certification.

The examples of successful uses of C&I and the benefits of this tool in promoting and achieving sustainable forest management should be further communicated to those fora that deliberate on trade and SFM including WTO/CTE, ITTO, COP of CBD and UNFF. This would likely speed finding solutions to increased market transparency in order to improve market access for forest products and services, especially those coming from sustainably managed forests.

3.1.11 3.4.4 Certification, Labelling and Other Market Instruments

Purpose and forms of certification

Certification is a procedure by which written assurance is given that a product, process or service is in conformity with certain standards (see ISO, 1996). Although different definitions and categories of certification exist, main types of certification schemes distinguish between first, second and third party certification as well as between system-based and performance-based certification schemes (table 3.2). Many, but not all certification systems provide labels for certified products or services. A certification label or symbol is indicating "that a product, process or service has been certified against a certain standard" (Dankers, 2002).

Table 3.12 Basic Principles of Certification Systems

Certification principles	Definition	Examples
First party verification	Internal assessment of production systems and practices.	Sustainable Forestry Initiative (SFI), business ethics standards, company standards, codes of practice, codes of conduct)
Second party verification	Assessment of a second party (<i>e.g.</i> customer or trade associations), who assess the company according to contractual obligations.	EU Regulation 2092/91, public procurement policies
Third party verification	Independent assessment of a separate accredited third party	International programmes such as the Forest Stewardship Council (FSC), the Pan-European Certification Framework, PEFC) and various national programmes.
Standards	"Documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purposes" (ISO, 1996).	Standards by various accreditation and certification bodies.
System-based standards	Focus on the <i>process</i> and evaluate whether specific systems are in place, which allow organisations and/or producers to achieve their (performance) objectives.	Environmental management systems ISO 14001/14004, Social Accountability 8000, SFI, Pan European Forest Certification Scheme (PEFC) Canadian Standards Association (CSA)
Performance-based standards	Focus on the <i>outcome</i> , the quality of goods and/or services, which should be in accordance to defined standards.	FSC, Rainforest Alliance/SmartWood, IMAFLORA, CFV, ERA, WWFMedPO

Source: Adapted from Walter (2001)

SFI, PEFC and CSA are mainly system-based certification schemes, which include some performance-based standards (Fern, 2001). Third party certification is defined by ISO as a "person or body that is recognised as being independent of the parties involved, as concerns the issue in question" (Carey, 2000).

PEFC is mainly based on the Pan-European forest process on criteria and indicators for sustainable forest management (Fern, 2001). Major inter-governmental processes or initiatives on criteria and indicators for sustainable forest management, covering some 150 countries, are documented by FAO (2001b).

Environmental management systems

A number of Environmental Management Systems (EMS) verify the progress of a company towards environmental commitments. One major EMS scheme relevant to the forestry sector is the 14000 series provided by the International Organisation for Standardisation (ISO). These standards assess and verify what companies are doing about applicable regulatory requirements and to reduce its impact on the environment. ISO is a process-based approach that verifies that the company is working to continually improve its environmental performance and allows entry at any level. ISO 14000 is expanding and experiencing considerable popularity in countries such as Japan, the UK and Sweden.

Table 3.13 ISO Certificates Issued in Forest Based Industry Sector

	1998		1999		2000	
	Wood and wood products	Pulp and paper	Wood and wood products	Pulp and paper	Wood and wood products	Pulp and paper
ISO 9000	2 218	1 316	1 967	3 279	2 225	4 785
	1.53% of all issued		1.91% of all issued		2.21% of all issued	
ISO 1400	34	209	109	232	212	520
	3.4% of all issued		4.1% of all issued		4.2% of all issued	

Source: ISO website

The statistics are not indicative of a significant trend in forestry corporations of using ISO standards but for those operations of an international nature. The flexibility in using an ISO-type standard makes it quite attractive to international corporations and those supportive of stepwise approaches to certification.

Fundamentally what sets ISO aside from forest management certification is that the emphasis is on a process model of continuous improvement of company systems (*vs.* forest management itself). There are neither benchmark levels of performance which producers or industry members have to meet to become ISO 14000 accredited nor specific forest management standards or criteria. Rather, the ISO standards require the improvement of environmental management systems as a means of reducing environmental impacts.

Achievement of ISO standards can be promoted in company literature but no labelling of products is involved. The marketing advantages are therefore limited in comparison with forest management certification systems. The motivations for introducing environmental management systems or seeking ISO certification are mixed but often reflect a desire to improve efficiency particularly in a context of tightening environmental regulation or increasing NGO and community pressure.

In South Africa, most of the large plantation companies have adopted environmental management systems and some have been certified. Sappi, for example, was one of the first of these to be certified to ISO 14001. Its environment department was looking for the means to provide the discipline required to cope with a changing legislative framework and national and international expectations and to gain management commitment. The advantage of ISO 14001 is that its emphasis on continuous improvement and allows for uptake by a company regardless of its existing management level. Furthermore, its management system framework is familiar to and therefore relatively easy to sell to the senior management.

Forest management certification

The purpose of forest management certification is to provide an incentive to improve the quality of forest management, through auditing forestry practice against specified standards. It is performance-based certification, and unlike ISO, minimum standards must be met before certification can be achieved. It also certifies actual forest management practices – not just company systems – and as such is a sharper tool for promoting SFM.

The ‘original’ forest management scheme is that of the Forest Stewardship Council (FSC), which was established in response to concerns about tropical forestry in particular, as an alternative to failing government policies (traditional instruments) and to threatened bans and boycotts. There are now a number of different forest certification schemes of one type or another, with the following coverage:

- About 100 million hectares of forest world wide (less than 3% of the world’s forest), mainly in developed countries (92% of the total certified forest area).
- All continents with the majority of certified forests in Europe (54%), followed by North America (38%), Africa (3%), Latin America (3%) and the Asia/Pacific region (2%)
- Both international and national forest certification programmes

Since its introduction, the potential value of certification as a tool for contributing to the achievement of SFM, has been recognised. Both the proliferation of schemes and the consequent rapid increase in certified area demonstrates the widespread belief in that value.

Figure 3.45 Certified Forests by Certification Scheme in 2003

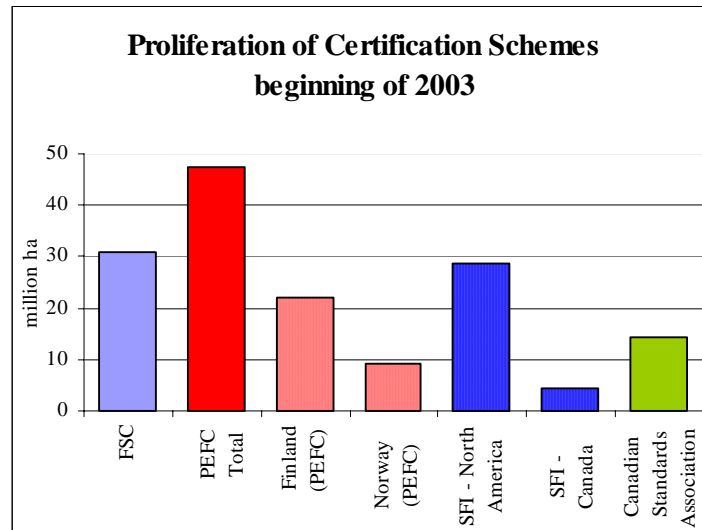
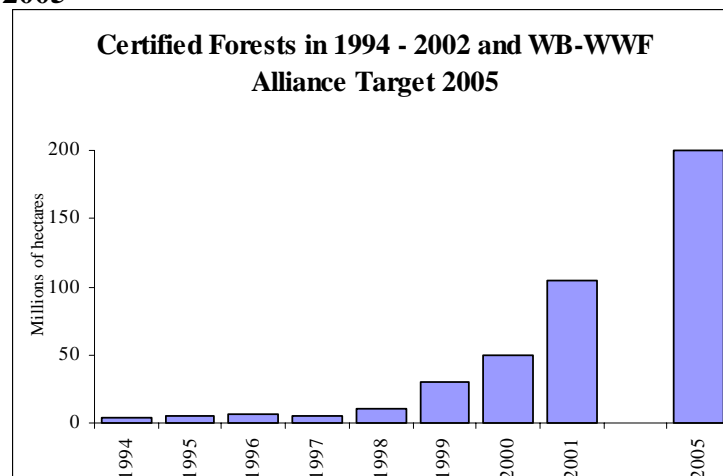


Figure 3.46 Certified Forests in 1994-2002 and WB-WWF Alliance Target 2005



Few forest management enterprises would argue that the process of achieving and maintaining forest management certification has improved their forest management practices. Certification demands both achievement of specified, minimum standards of forest management and some level of system against which to verify practice through an audit. Thus, the actual level of improvement (incremental difference) depends on the starting point for each enterprise. The standards required by certification schemes are 'best practice', and mean that almost all enterprises have to make some changes to their operations on the ground in order to achieve it. Key impacts of certification on SFM include the following:

- *Environmental impact:* An improved approach to environmental issues is widely reported, with better EMS', better monitoring and research, better dealing with bio-diversity issues. The general trend is for a 'tightening up' or consolidation of procedures, rather than wholesale change from 'bad' to 'good' – many enterprises (especially the larger, developed country ones) will at first say that certification has made no difference to the forest operations on the ground, before conceding that the procedures are now better to ensure and record best practice. By contrast, producers in Malaysia have observed that certification criteria guided on the ground practices and keep operators on track

- *Social impact:* There are widespread observations of better stakeholder consultation and communication, better health and safety systems for workers, and improved attention to all the social groups who might be affected by forest management. In South Africa in particular, the forest industry feels that certification has kick-started improved thinking on social issues, which was previously a significant problem.
- *Economic impact:* The improved management, monitoring and recording *systems* have enabled better planning of forest and financial resources, better communication has prevented later problems, certification has improved corporate transparency. In general, enterprises observe better efficiency and consequent cost-effectiveness all-round. Many, especially smaller, enterprises in the UK feel that certification provided a useful management review that improved their business.

Most of these changes link to the audit process itself. Audit requires documented management and monitoring records and plans – not something that all enterprises previously kept, or not in a systematic way. The use of agreed standards of forest management has led to a shift towards more scientifically rigorous models of forest management (especially for smaller and community forestry enterprises, especially developing countries). In addition, the process of standard setting, where it has been done at a national level, has been useful in bringing together wider range of stakeholder interests to discuss the meaning and implication of ‘SFM’. This has increased awareness amongst practitioners and has filtered through to policy definition and forest planning – with an assumed trickle-down to practice. Participation in developing standards means that standards are more about ‘S’ than just ‘FM’.

A key observation is that most operations that have been certified say the biggest challenges have mainly been about implementing the systems to aid audit and verification, rather than wholesale change in practice ‘on the ground’. Forestry has traditionally been in many cases a practice of management ‘from the gut’, rather than a systematic operation with clear checks and balances. Standards and performance criteria are new to many operators, who have traditionally relied on a ‘feel’ for the natural environment. This is especially the case for smaller and less developed enterprises – these variations will be discussed below.

Because certification demands best practice, uptake is generally easier for companies that already have good practice – for example, many companies applying for FSC or PEFC forest management certification already have ISO certification. Therefore the incremental impact on SFM is generally perceived to be limited. The worst performing forestry companies remain ‘out of reach’ and the minimum performance standard approach of forest management certification seems unlikely to encourage SFM amongst them. Certification has not yet offered incentives to change the behaviour of the bad producers.

However, these are generalisations – the reality in practice depends greatly on the type and location of the enterprise. Forest producers are extremely varied – from large corporate ‘fibre factories’ to individually and commonly owned land with some trees on it. It is worth looking at some of the different types of forest producers and the circumstances under which they normally operate to analyse how certification impacts on forest management differently.

Comparing large and small enterprises: Relatively few small forest owners are taking the steps to improve SFM by getting certified. In 1999 only 4 percent of FSC certified areas were ‘small enterprises’, which was causing concern to FSC and discontent and resentment in other players. Main reasons hindering certification of small enterprises are high costs, difficulties in compliance and problems to access information. The cost per hectare or per cubic metre increases with decreasing size of the organisation – the smaller you are, the higher the proportional cost of certification. The cost of USD 1 000 is cited as the minimum cost possible for certification– for small areas of forest or woodland this is clearly very high, and does not yet include any costs of management improvements to reach the standards.

- *Compliance* – the issue of improvements needed to reach the standards also relates to the appropriateness of standards for the smaller woodlands. Many small woodland owners find the standards difficult firstly to understand (see box) and secondly to implement, as the requirements are more adapted to large forest areas than small ones.
- *Access* – In countries where there are no active certification working groups, small forest owners cannot easily get access to information about certification or certified markets. They are thus far less likely to proceed with it.

The problems for small forest owners also link to the *systems* needed for certification. Large enterprises and forest management companies usually have some level of systematic approach to SFM, with procedures, reporting practices and checklists for managers and contractors, which makes audit relatively easy. Small ones tend to manage on a more ad hoc basis, as current circumstances dictate. An analysis of the impact of UKWAS certification in the UK, for example, highlighted that most certified small forest owners previously had few if any systems in place for managing their forest and that this had to change to enable the required audit process. Whilst seen as a worth while thing to do, many had found this a significant challenge and would not have been able to face certification without professional help.

Comparing plantations and natural forests: The majority of certified forests are well-managed plantations (mainly in South Africa) and certified by FSC. Plantation management is typically more systematic than natural forest management. Planning and management towards harvest is in place and it tends to be easier to go through the audit process. Many of the ‘sensitive issues’ that certification was designed to address, such as forest loss and degradation, and local use by communities, are less of an issue (proponents of FSC had not designed plantation issues into the scheme to start with). In developing countries, the majority of certified forest is plantation – there are very few certified natural tropical forest areas.

Comparing developed and developing countries: The area of certified forests in developing countries is only 8% of the overall total (including all types of third party forest management certification systems). The share of tropical timber producing countries (ITTO members) is less than half a percent, contrasting with North America’s 9%. By contrast to the average, 19% of FSC certified forest is in developing countries (Ebaa’ a, *et al.*, 2002).

Different countries operate under very different conditions, particularly relating to both management standards and to enforcement/legality issues – the two issues are, of course, linked. Developed country foresters are subject to effective and regulated legislation, whilst in developing countries, even where there may be good legislation, it may not be enforced. Partly due to weak enforcement of legislation, and partly linked to real economic and technological hurdles, the majority of enterprises in developing countries operate to much lower standards. Consequently, achieving the standards required for certification is a much greater challenge. This is despite western perceptions that the intensity of auditing in developing countries is lower. Many people feel that certification schemes have not been designed in a way to allow developing countries to make progress in this field

Box 3.4 Problems in Tropical Forest Management

“There are a number of reasons for the slow progress of forest certification in the tropics, but one of the most important is that in many tropical countries there is a wide gap between the existing level of management and what is required by certification. This creates a number of problems:

- Considerable resources are required to close the gap and implement the requirements of a certification standard, but these countries face many institutional, social, human resource and financial constraints, which means that such resources are often scarce.
- The process of implementing the standard can be very lengthy, often taking several years. If there is no mechanism for periodically assessing the progress made, forest managers may not realise when it is inadequate until they miss deadlines or commitments for achieving certification.
- There are no intermediate incentives available for forest managers who do undertake this long and costly process until full compliance is achieved and a certificate obtained. As a result, the continued investment can seem difficult to justify.
- Forest managers can be overwhelmed by the number of activities to be undertaken in order to meet the standard’s requirements.”

Source: Ebaa’ a, Nussbaum and Simula (2002)

Developing country producers often perceive certification as yet another market requirement imposed by their buyers, they find it difficult to meet and fear it will become a barrier to trade rather than help them export. Having looked at these differences, it is not surprising that biased patterns of forest management certification have emerged. The key imbalances have reflected the scale and location of enterprises reflecting several key issues:

- Economies of scale – costs of getting certified and getting into markets is relatively bigger the smaller you are, and the further you are from the standards. The cost issue has been a major debate as noted in the box below.
- Standards assuming western, scientific approach to forestry – lots of info, requires formal training to understand the standards, non-prescriptive standards means they must be interpreted, standards do not take account of the very different socio-cultural conditions or complex land-use issues in developing countries.
- Assessors' interpretations/bias – often western, technical-forestry focused, not always seeing big local picture.

The issue of the cost of doing SFM – and who is best able to carry it – is important here. Many enterprises in developed countries relate that the changes required to meet certification were limited, more about systems than operational practices, and have not increased costs significantly. Meanwhile in developed countries, some enterprises record cost increased of up to 30 %. The typical and widely observed trend is that producers carry the cost of certification, whilst manufacturers pass it on to consumers.

Consequently, there have been significant recent moves to address the imbalances by overcoming these problems – to make the certification process (the 'tool') something that every forest enterprise can aim for if it wants, and if the market demands.

Making certification work for small enterprises: FSC has addressed this problem by developing the Group Certification approach. This allows small enterprises to come together under one certificate (either forest management or CoC) to allow better economies of scale in terms of fees and monitoring effort. FSC has also taken up the recommendation³¹ of developing a version of the standards specifically for small forest enterprises. This will be required of every national standard development process in order to help understanding, interpretation and implementation of the certification standard by small operations. These efforts have been reasonably successful for FSC – now almost 20% of FSC holders are smaller than 1,000 ha.

Even more dramatic in terms of bringing in small enterprises has been the introduction and uptake of the PEFC and ATFS. Both were specifically designed with the smallholder in mind (though PEFC also covers large enterprises) and now account for 48% of the worlds certified forests. In Finland, around 96% of the national forest area is now certified to one system or another – a significant leap forward for the many smallholder foresters who could not see a way forward under the early FSC approach.

Promoting a stepwise approach towards certification: Certification remains a challenge for developing country enterprises largely because of the 'gap' between their current management standards and the minimum performance standards that certification demands. But the industry has recognised that these enterprises need some incentive and encouragement in order to encourage efforts towards certification. The process of improvement towards being certified takes time and investment, and, without the returns of the access to export markets that certification brings, few enterprises can afford it - they may as well continue selling to markets that do not demand it, and continue 'business as usual'.

To overcome this, some of the certification bodies (*e.g.* SGS' Certification Support Programme) and other organisations (*e.g.* Tropical Forest Trust) have begun to develop models for a 'stepwise approach' (or 'phased approach') to certification that can 'reach down' to producers and pull them up gradually. The approach is for a third-party gap assessment followed by an action plan towards certification with the company. The certifier is then monitoring the progress towards the action plan.

Box 3.5 Phased Approach to Certification

The model for the phased approach involves two main stages:

Stage 1: 'Initial Evaluation / Pre-Assessment' – essentially a gap assessment (identifying what needs to be done to achieve certification).

Stage 2: 'Development & Implementation' – essentially a work plan towards bridging the gap (identifying and carrying out phased actions towards achieving certification).

Organisations are then continually audited against an agreed work plan and audit schedule based on meeting certification requirements. The SGS-CSP issues 'Audit Statements' throughout the development and implementation stage to track progress in achieving the scheduled objective and targets listed in the detailed work plan. The organisation can market material under a CSP - Certificate of Origin during development and implementation (Stage 2 of the CSP).

Source: SGS website, and Ebaa'a, Nussbaum & Simula 2002.

Supply chain certification

A 'supply chain' is the chain of ownership (or 'custody') of a product from producer, through processors and manufacturers, to distributors and retailers. Labels are the means of letting the market know that goods have been managed according to given standards. They can be tied to certification programmes and used as a marketing tool.

Labelling typically involves getting 'Chain of Custody (CoC) Certification'. This provides an unbroken trail of acceptability that ensures the successive links in the supply chain of forest products, from transport to processing and distribution can be verified to product origin. The nature of the product will determine the level of complexity of supply chain management. For example, the systems for high value wood products such as furniture may be relatively simple compared to the production and certification of particleboard or pulp and paper products where a degree of product segregation will be required. So far, the only forest management certification schemes providing CoC and labelling options are FSC and PEFC.

Bass *et al* (2001) have undertaken a comprehensive analysis of the impacts of certification on supply chains. Their key findings indicate that certification contributed to the following:

- Increased transparency in supply chains, ensuring certified companies selling consumer products to European and American markets or to businesses and governments now know where their products come from.
- Flow-on effect in corporate mindset - rather than keeping supplier identity confidential for competitive advantage, more companies are making supply chains transparent to reduce threats to corporate reputation.
- Changing purchasing patterns - companies seeking certified products will change suppliers to access such products, but such decisions often also relate to other economic or business imperatives. Certification has diversified the supplier base for many companies, with consumers having more choice from sometimes unexpected origins.
- Sub-sector change, not across the whole industry - the retail sector supply chain, particularly in the softwood sector, there is pressure for suppliers to become chain of custody certified. However, this is not really the case for businesses not supplying retailers or tropical forest managers as there is a much less formal, and to some extent less transparent, business ethos.

Purchasing behaviour in various links of the supply chain has influenced trade in forest products, and when combined with certification, this has a flow on effect to sustainable forest management. However, this has been the case most notably in those operations that do not have to make large leaps to become certified.

Certification, Policy and Trade

Certification was originally intended to be independent of government intervention, as a *voluntary* market tool to promote SFM. However, the success of certification in encouraging SFM and the influence of policy on a large number of players has meant that there is benefit in government being involved in standards setting. This has been born out by a number of country examples.

Committees set up for multiple stakeholder certification processes have been used as a model for other governmental purposes such as standards setting or national forestry program (NFP) development. In Ghana, where no multiple stakeholder forest forum previously existed, the certification group was used as a model to establish the NFP group.

However, in countries such as Malaysia, Ghana and Indonesia, where government has been extensively involved, certification can be viewed as a means to implement policy, rather than a means to challenge and improve it.

Governments can also influence whether certification is adopted by the private sector. Subsidy structures can encourage the establishment of forestry infrastructure. Lower stumpage fees, forest rents and trade tariffs can also provide incentives. To maintain such benefits, private sector must be actively engaging with the government. The formation of producer and buyers groups provides a powerful lobbying influence on government processes, and provides a point of reference for governments seeking consultation on policy development. Consequently the two groups, when combined with civil society organisations, can be more effective.

Finally, government and local authorities have significant buying power and thus can influence the market through the development and implementation of policies, which encourage the purchasing of products, which meet sustainability and legal criteria.

The benefits derived from certification in forest policy processes have primarily come about through the participatory approach to certification standards and the procedure development, especially where national certification working groups have been organised. The consultative process brings together all actors in the forestry sector to work towards a common objective. The ability to meet regularly over a period of time to develop standards and to conduct audits, builds trust and a shared objective between groups previously thought to have different imperatives. This is certification's primary contribution to sound policy processes.

- *Major advantages come through the participatory processes of standards development rather than the cumulative certification of many forest management units.*
- *Decentralised and democratised the policy process. Previously marginalised stakeholders are part of the working group to develop standards and procedures. Improved definitions of Sustainable Forest Management through the development of a wide range of standards and guidelines. Open processes to define standards, test and refine criteria and indicators.*
- *Increased dialogue between stakeholders from government, private sector, NGOs and civil society and loosening of professional cliques.*
- *Improved legislation. In some cases certification has impacted the means for implementing existing laws, rather than changing the content of the law itself.*
- *International policy impacts through the involvement of international organisations such as ITTO, UNFF and FAO in reflections on forest certification..*

Certification is particularly effective in situations where the policy and regulatory framework is already sound. Whilst the old command and control approach to forestry management is no longer relevant, its building blocks are still required to act as incentives and disincentives. A sound policy framework provides the broad and long-term framework for sustainable forest management and appropriate legislation acts as a “stick” for poor performers. Certification, along with a number of other market-based instruments, can increase the likelihood of meeting policy targets, and reduce enforcement costs associated with traditional command and control approaches.

A critical issue in many developing countries is unclear ownership of forest resources. This often results in a short-term view of resource utilisation, providing limited motivation to support the implementation of forest policy or to become involved in processes such as certification.

There is no clear evidence to suggest that certification can and should be universally applied in preference to other tools for policy implementation. Regulatory, information, institutional, contractual and other market tools are all valid ways of achieving sustainable forest management. The trick is to get the appropriate mix of tools correct, providing a balance of coercion, persuasion and incentive.

Trade in certified products is probably highest in the UK, where market share of certified products is about 25%, compared to less than 5% across the EC, about 4% in the Netherlands, and 1% in Germany and similar in USA. Globally, the ITTO approximates certified products as about 8% of the total, but there is no mention of certification in formal ITTO and FAO trade statistics.

Sawnwood and solid wood products have dominated most of trade in certified forest products. Main markets are in the home improvement. On the other hand little change has taken place in paper or construction markets as yet. Paper has experienced CoC certification problems – though this is easing with debate and compromise.

Some small markets emerging for certified non-wood forest products (NWP) such as fruits, nuts and medicinal plants. NWP certification is more complex than certifying timber, as more than one product may be assessed in the same forest area, and the requirements of management can be different, and even conflicting. In addition, certified timber production does not necessarily guarantee sustainable NWP production (and *vice versa*).

Changes towards certification in forest products are clearly slow in the international trade – mainly due to the perceived and real supply and demand problems. Total demand for tropical timber certainly outstrips the supply of certified tropical timber, for all the reasons highlighted previously. In particular, many producers remain deterred by perceived high costs of certification. Slow progress towards mutual recognition of different schemes also deters further certification, and thus supply and confuses demand.

There is no clear evidence of consistent price premiums, though there are some reports of (mainly temporary) premiums in particular for the tropical hardwoods in short supply. An example is quoted in FSC's newsletter (Mar-April 2003) of a 44% price premium on FSC logs at auction in Malaysia – but this may reflect the context of local/regional prices vs. European prices. In the UK there is evidence of pulp mills paying 1-20% less for uncertified wood.

There is some debate about the justification of premiums – buyers purport to want ‘to make sustainable timber sources more competitive than unsustainable timber sources’, whilst producers complain that ‘people want us to do good forest management but are only willing to pay the same as for illegal logs’. The real problem is that wood products are not priced appropriately to include the environmental and social costs of good products.

However, certification differentiates suppliers in the market place, gives market advantage and influences some customer buying decisions. For example, in the Netherlands there was no traditional trade in Scandinavian softwoods, but due to the government/NGO promotion of certified wood, now Scandinavian softwoods are on the market. Similarly, the UK home improvement store Homebase previously did not buy from South Africa, which is now supplying 10% of its wood purchases, in plantation pine products. It has been observed in the UK that there has been a general shift away from tropical hardwood towards more ‘trustworthy’ North American and European hardwoods, which are experiencing a significant revival.

Some influences have been less directly attributable, for example, ten years ago in the UK the majority of new window-frames in buildings were made from U-PVC, partly because wood's bad press. Now wood is much more in favour and is in higher demand.

Market growth is constrained by limited supply and demand, limited interest from forest owners, and the proliferation of certification schemes. What are the emergent push and pull factors influencing these patterns?

3.4.5 Codes of conduct and other voluntary initiatives

Codes of conduct

World wide there is an increasing trend for forests to be managed by the private sector rather than the state. Consequently, the private sector is in many places keen to demonstrate their reputation in order to protect and maintain this situation.

Codes of Conduct are an industry initiative that aims to set standards across an industry or company and provides a set of principles by which members of associations/companies agree to behave (‘first-party’ declaration/certification). Where codes reflect environmental values they can be a very useful tool to support sustainable practices. However, a key caveat is that to be effective the Code must have ‘teeth’ – the ability to sanction members effectively. Many industry Codes of Conduct do not, or sanctions are not meaningful because membership does not bring tangible benefits (for example access to markets, training, industry information etc) that make them need to stay in the association and comply.

An example of a Code of Conduct is the UK Timber Traders' Federation (TTF), which represents the majority of UK importers. It published its code in 2002 and it is one of the few with effective sanctions. The code states that “members are committed to sourcing their timber and timber products from legal and well-managed forests” and that “Members unreservedly condemn illegal logging practices and commit themselves to working with suppliers and other stakeholders towards their complete elimination”. The Code further states that “independent certification of forests and the process chain is the most useful tool in providing assurances that the timber they deal in comes from legal and well-managed sources” The Code has a Code of Conduct Complaints procedure with sanctions including fines and suspension of membership and expulsion from the Federation.

The UK Code has been used as a model for newer schemes in Africa, Japan, Netherlands and Italy. A number of TTF members have also signed up to the ‘Forests Forever’ Environmental Purchasing Policy

that assesses suppliers to ensure timber importing companies trace their purchases through the supply chain to ensure high forest management standards at source and report annually.

Supply-chain management

Some large companies have established systems to trace the source of the wood they use and to ensure that it has been harvested from well-managed forests. These internal supply-chain management systems have usually been in response to NGO pressure or bad publicity about one of their suppliers. In some cases this approach has been a forerunner of moves to require suppliers to achieve certification. The UK DIY retailer B&Q, after high profile NGO campaigns linking European consumption to tropical deforestation in the late 1980s and early 1990s, stated publicly that it would buy no more tropical hardwoods from Brazil because it could not be sure of its source. Its next step was to develop systems for tracing the sources of all its wood-based products. This was followed by a policy of persuading its supply base to become certified.

Ethical investment funds

A rise in the awareness of and demand for Corporate Social Responsibility (CSR) in recent years has seen an increasing number of large companies becoming concerned about their environmental and social responsibilities. Research indicates that 130 of the UK's top 250 companies produced environmental reports in 2001, of which 70 included social and ethical performance. Companies are beginning to see the link between their financial performance and how they deal with sustainable development and CSR.

Responding to such pressure, markets have developed for 'ethical investment funds'. These are investment funds, which allow investors to select or exclude certain industries from their portfolio (for example, exclusion of tobacco companies, animal testing, biotechnology, *etc.*). Since 2000, in the UK occupational pension fund managers have been required to disclose the extent to which they take into account social, ethical and environmental considerations when they make investment decisions. However, a pension industry review suggests that this has had limited impact to date as few funds have yet to invest 'responsibly'. In addition, relatively few forest management organisations are registered on the major stock markets for investments and thus are not likely to be influenced by these pressures, unless their buyers are.

It is difficult to assess the impact of ethical investment funds on forest product trade patterns and forest management. In general, this type of fund invests mainly in established companies listed on developed country stock markets and invests very little in developing country companies. They are unlikely to invest in or have much influence on companies engaged in natural forest operations in the tropics. As the forest sector globalises and foreign direct investment increases their influence is likely to grow. At present, they are important as one of a number of factors, which together will influence company behaviour. The South African forest product company, Mondi, was affected by the London listing of its parent company, Anglo American. This introduced stronger pressure from shareholders and more stringent reporting and disclosure requirements. This increased investor scrutiny was one of a number of factors which in addition to market pressure, prompted Mondi to seek FSC certification for its forest operations.

More direct impact can be expected from socially responsible venture capital funds, which provide larger amounts of capital for company start-ups and expansions. Specialist Timber Investment Management Organisations (TIMOs) raise money from institutional investors to manage a portfolio of forest properties and are important players in the US. As timberland investments tend to move counter-cyclically with stocks and bonds they constitute an effective way for institutional investors to diversify and reduce risk. These organisations typically adopt a policy of sustainable forest management and several of them are looking beyond the US to investments in emerging markets. For example, the investment made by GMO in the company Gethal in the Amazon, Brazil, was conditional on a strategy to obtain forest certification. However, investment by the TIMOs in natural forest operations in the tropics is relatively rare. Their preference is for plantation forests in temperate countries with low political risk. UBS Timber Investments which manages over USD 1.3 billion focuses on Argentina, Australia, Chile, New Zealand and Uruguay.

Environmental liability

Provision of bank finance to companies making investments abroad or launching a new type of activity has typically been preceded by an analysis of both commercial and non-commercial risks, with the extent of political risk often being a deciding factor. Increasingly, commercial banks are incorporating environmental assessment into their due diligence provisions

The need for this has been highlighted by the case mentioned earlier of the pulp and paper sector in Indonesia. The international banks involved did not adequately assess the risks related to timber supply and social conflict. In some cases, this was because export credit agencies guaranteed the companies' loans.

Corporate social responsibility

Environmental niche markets for forest products are growing – in Europe and North America in particular, although social niche markets remain small. These markets increasingly are shaped by 'soft law', such as certification, which is scrutinised by civil society. Product chain-of-custody information is also becoming increasingly important as buyers, manufacturers and producers attempt to send signals through the supply chain about market demands and sustainability.

Until recently the social responsibility of a major forestry company ended with its formal obligation to pay royalties and taxes and perhaps cash compensation to communities for lost assets, a few jobs and perhaps the construction of schools and health clinics. Yet a few big companies involved in forest trade are paying more attention to a wider group of stakeholders. It is widely claimed that companies practising corporate social responsibility have a number of financial benefits, which ultimately affect the returns and risks for investors. Typical arguments include:

- Clean technologies are usually more efficient. Similarly, good working conditions can lead to higher productivity and fewer disputes with labour unions and make it easier to attract and retain employees.
- Changes in legislation (*e.g.* tightening regulations) or changes in rules on liability for damage can imply significant costs and companies that can prepare for regulatory change will have a competitive advantage.
- Less risk - Companies with good environmental and social performance are likely to be perceived less risky by financial markets, which tends to reduce capital cost and insurance premiums.
- Secure markets - compliance with environmental and social standards can secure markets, and occasionally higher prices.
- Public reputation - this can affect the company's social licence to operate, reducing the time required to secure government approval of, and community support for, new developments or expansion.

In many developing countries, the first two factors are less relevant as enforcement of legislation is weak and consumers are interested primarily in price and quality alone. So the argument hinges on the financial implications of company reputation at local, national and international level.

The most common reason for not specifying and using certified wood is 'there is not enough supply'. But it is clear that without increased demand (market pull) the benefits of certification will not materialise, and without support, many producers will turn to easier markets rather than invest in improvements towards SFM to enter 'green' markets (market push).

The pull factors include procurement policies, buyers groups, consumer demand, price premiums, and preferential market access. The push factors include efforts to make certification more accessible (group and stepwise certification) and support to producer and trade groups (like the GFTN).

Key trends in pull factors: The UK's Timber Trade Federation predicts that government procurement policies (linked to illegal timber issues) could significantly change the pulling pattern – potentially involving 20% of UK timber industry. In addition, lots of architects working in private as well as public sector are now asking for advice on sourcing of sustainable timber. Similar patterns are emerging across Europe and North America.

Domestic markets in producing countries are also critical to the 'pull' – where there are strong domestic markets (e.g. Brazil and India), producers may feel export is unnecessary and therefore avoid certification. Without domestic demand for certification, certification is unlikely to have an influence on SFM.

Key trends in push factors: The advent of group certification has made a significant difference to the take up of certification and therefore trade. Step-wise approaches look set to extend this. Linking up supply and demand through initiatives such as the GFTN and TFT will also be key. The approach of mutual support appears important in terms of re-building the balance – many producers feel that they have been the weaker player in the trade of certified products until now.

An overarching current problem is the general global trade slowdown since "9/11". When supply is low, traders take what they can get and certification becomes less important as a specification. This has been an issue for tropical hardwoods, especially Asian, in recent months.

Remaining Challenges: At the moment, certification typically acts to highlight good practice, promoting only minor incremental improvements in SFM. It does not yet clearly apply pressure to transform the worst problems of forest use. The key issues for the future are in getting certification beyond the 'good' producers and making it influential and applicable to the 'bad' ones.

It remains an expensive process (improving practice and paying for audit) for many – the debate clearly is still polarised in terms of where cost is and should be borne, and this needs to be opened up. Step-wise approaches and support from buyers to producers are helping – without significantly more market pressure (demand), producers will not shift to SFM through certification. These progressive and pragmatic initiatives will increasingly be necessary to protect the future of the wood industry and ensure sustainability.

3.1.12 3.4.6 Public Procurement Rules

Purchasing policies are essentially guidelines for staff to utilise in the selection of products and services to meet the required criteria. These include 'green purchasing' policies, which place environmental values at the forefront of any purchasing decisions, and procurement policies where environmental factors do not necessarily preclude purchase, but must be considered, amongst other factors, when making purchasing decisions.

Many EU member states are in the process of developing their own public procurement policies, under the umbrella of the EU Procurement Directive. The Directive provides criteria for sustainability and legality assessment, but also states that contracts must not create barriers to trade and discriminate against suppliers from other countries. The implementation of such directives is controversial and has led to differing views of as to whether environmental criteria can be used to assess tenders. The Commission has argued that such criteria cannot be considered at the award stage as they do not bring an economic advantage that directly benefits the public authority, but experience has shown that if environmental considerations relate to the tender subject then they can.

Box 3.7 Using Environmental Criteria in Procurement

In September 2002, the European Court ruled that when a contracting authority decides on the award of a contract it may only take into consideration criteria linked to the subject matter and do not confer unrestricted freedom of choice on the Authority. This meant that in cases such as that in Helsinki over the purchase of low-emission buses, as long as the criteria linked to the subject matter and the tender process was managed in a transparent manner, non-economic factors could be taken into consideration.

In Germany, some local authorities have implemented a procurement policy, prescribing certified timber. Some states in the USA have similar approaches. The development of Kerhout in the Netherlands has closely reflected the Government's priorities. The UK in particular has spearheaded implementation of these commitments.

The UK Government commissioned an in-depth consultation on "procurement of timber products from 'legal and sustainable' sources by UK Government and its executive agencies". This is clear evidence that the Government wants to change the way it acquires timber and timber-products, in response from the policies in place. The UK procurement policies encourage use of certification schemes as evidence of wood products being 'sustainable and legal'. Due to uncertain supply of certified products, procurement officers are increasingly supportive of the step-wise approach to help ensure that, where they can't get certified products, they are getting legal products. The Government believes that this supply-chain pressure will in turn lead to more producers seeking certification.

As more governments develop similar policies and guidelines, this trend is likely to continue. Government procurement officers need to find ways to simplify access to specified and acceptable products – this will most probably promote certification, within the bounds of trade regulations and WTO.

Any Government body insisting on certification as a pre-requisite for import could be contravening WTO - anything 'mandatory' is difficult to reconcile with WTO. 'Voluntary' means that demand has to come from the consumer to transform the market.

In the USA many of the local governments have stipulated against illegal and unsustainable sources in their wood procurement. Annex 2 compiles a list of these regulations.

Box 3.8 Debate about Certification and WTO

Pro certification: Friends of the Earth spearheaded campaigns based on the fear that WTO would restrict the use of non-tariff measures such as eco-labelling and standards, and that this might result in threatening certification schemes such as FSC that promote SFM.

Pro WTO: International Chamber of Commerce has lobbied against eco-labelling, arguing that it hinders free trade. Whilst recognising that much depends on precise circumstances of any given situation, debate in WTO was concerned about the following:

- Ecolabelling/certification is expensive and is only available to those who can afford it.
- Standards might be difficult for 'foreign' competitors to meet (ie standards biased to domestic producers), and that then there could be discrimination of those foreign producers, especially those in less developed countries. Much depends on the precise.
- If the high costs or standards make it difficult or impossible for producers from poorer regions to get certified, then those producers are in effect (if not intention) banned from certain markets.

On balance: According to the 'Agreement on Technical Barriers to Trade, the use of environmental standards (including certification) in product specifications for import could be deemed a technical barrier to trade. But overall, voluntary certification schemes are in accordance with WTO rules (and are seen to be a good way forward as a trade tool by Klabbers), partly because social and environmental objectives of certification are deemed 'worthwhile' and in the public good.

To fit with WTO, UK procurement policies encourages use of certification schemes as evidence of 'sustainable and legal', but allows for a tenderer to put forward 'other forms of evidence'. However, this leaves government procurement officers, trying to fulfil government commitments, with a difficult problem of how to assess the credibility of the evidence – how do they decide which labels to accept? The commissioned consultation recommends accepting only labels authorised by 3rd party certification/labelling schemes, which conform to the UK's sustainability criteria, and require mandatory 3rd party verification of other evidence. The supplier would then have a choice in how to demonstrate compliance and specific labels or certification schemes are not mandatory. The procurement officer would then only have to make one initial assessment of which certification and labelling schemes conform. The associated demand to require 'legal and progressing to sustainable' (where there is no certification of SFM) supports the need for step-wise approaches to certification that will verify legality as a first step and is useful as a focus for producers.

Clearly, harmonisation of the proliferation of certification and labelling schemes would be important to ease assessment – the forest industry needs to concentrate on what standards it is prepared to accept and adopt. This would also help to ease WTO's fears. However, as yet, no known forest certification cases have been brought before the WTO TBT panel. As Roe *et al* point out, this suggests that the potential trade barrier problem is being dealt with by governments and is not emerging.

3.1.13 3.4.7 Future Prospects of Market Based Instruments for SFM

Although forest management certification has also been recognised as a potential tool to promote sustainable forest management, the efficacy of this tool is still subject to considerable debate at the international level. Furthermore, although the certified forest area has increased rapidly it is not likely that expansion continues boundless. Only 7% of global industrial roundwood output is traded; many developed countries consider certification as a trade barrier; and markets for certified wood are limited as customers are rarely ready to pay premium.

The debate between different certification schemes continues, although common understanding among the schemes is gradually emerging. The proliferation of certification schemes has exacerbated the need for an international framework for their mutual recognition and a set of internationally agreed criteria and indicators as reference for a credible forest certification. (Parviainen and Suoheimo, 2002 and Tang, 2002).

However, do consumers really care which certification scheme is used? Likely, only a small percentage care at all; and some may be satisfied by just knowing that the forest product comes from a well-managed forest. The key seems to be reliable, credible information on the conditions and trends in forests and forest management, rather than certification per se. C&I can serve as a tool, a framework to provide such information for all users. Perhaps the efforts in the future should concentrate more on how to obtain the reliable data, rather than arguing which certification scheme is the best.

With increasing number of certification schemes, the role of governments in certification is also increasing for setting the broad rules of game and follow-up on possible political implications of how certification is implemented. This trend may also contribute to the increasing role of C&I in certification.

It remains unclear whether there will be a strong and growing demand for certified wood. However, there appears to be an increasing demand for accurate, reliable information on forest conditions and management. C&I provide a widely recognised framework to arrange such information.

Government initiatives have often failed to curb forest loss and degradation. NGO campaigns have raised awareness of the problem amongst consumers, and threatened attacks on the wood industry. Consequently, the use of market-based instruments as an alternative approach to promote SFM has increased rapidly. Forestry is changing from being a problem that only governments are held responsible for, to a problem that civil society and consumers can and do influence.

A key issue throughout this review is the increasing recognition of the real cost of forestry. As social and environmental values of forests are grappled with, this cost is being estimated and efforts made to cover it through a variety of means and new instruments. It remains a challenge, not least in terms of ensuring that the cost is borne equitably, by all the real users, and not only by the producers or those who have to live with the consequences of deforestation.

Traditional instruments used by governments are increasingly trying to link into the real price of forestry through more rational stumpage fees, performance bonds and incentives – the much-needed new innovations are being developed and tested by economists world-wide, as failures are common.

Abstinence appears to have been most valuable as a threat to stimulate change, by creating awareness of a need to change and pressure on the market to do so. As a tool to do this it has been extremely effective and the role of NGO campaigns remains strong, but only in constructive partnership with other tools that can implement the change. Without this, bans and boycotts risk simply pushing the problem elsewhere and excluding the problem from dialogue towards solutions. Experience suggests that campaigns that point to solutions and are well informed are more successful in building a dialogue of trust within the market and avoiding confusion and misinterpretation.

Certification links to all of these. It has seen a massive expansion in the past decade. Ten years ago, retailers could not tell their customers anything about their wood supply – now some can give confident information on the sustainability their sources, right to the forest level. But it is clear that certification can only really impact on SFM if it is more widely taken up – not just adopted by those who can achieve it easily, without much change. Evidence highlights that certification needs to resolve some of the problems, which make it difficult for some stakeholders to use:

- Consumers need reliable and simple labelling - the mutual recognition debate is important.
- Small enterprises need to be actively included – this is being addressed through group schemes, simpler standards and cost-saving through local certifiers and schemes
- Developed country enterprises need to be encouraged into the markets – developments towards step-wise approaches and producer group support from buyers will be increasingly key.
- Markets and demand need to be significantly expanded - buyers groups need to be developed in new areas (*e.g.* ongoing efforts in China) and domestic markets (*e.g.* Brazil).

Forest policy reforms are beginning to link into and learn from the certification experience. This can broaden the SFM impact of certification, and there is opportunity for improved efficiency of forest governance as a result.

Trade groups and pressures have become increasingly important in response to increased market and public awareness of forest problems. This area is likely to become more important – government procurement policies are focusing increasingly on forestry issues and buyers are beginning to see the need to work with producers to improve their performance and maintain their market in the face of consumer fears about wood. Trade cannot influence forestry if fewer people buy wood.

Market based instruments (MBI) can be extremely effective at promoting SFM, but typically to date have only really worked in well-developed markets and economies. It is also important to recognise that MBIs are diverse and often complementary to each other, and to traditional regulation. There is no simple, single solution – they can only be applied as part of a holistic drive to promote SFM. Markets and trade are only a small part of the influence on SFM in its wider sense.

4 3.5 Market Development for Environmental Services of Forests

4.1 3.5.1 Essential Attributes for Effective Market Creation: Framework for Analysis

The potential of various environmental services for market development varies considerably, because some services lend themselves better for trade, whereas in some cases supply can be ensured best through instruments such as taxation and government regulation. In this study, the marketability of key environmental services, or their proxies, will be analysed using *a set of criteria*, based largely on the assessed degree of excludability and rivalry and possibilities to eliminate or reduce the impact of factors prohibiting effective formation of markets.

Several attributes, which “measure” marketability/tradability as well potential to influence forest products trade have been identified as the framework for the analysis:

1. *Easiness of defining and enforcing a property right*
2. *Degree of excludability and rivalry*, i.e. how easy it is to exclude consumers from enjoying the service even, if they do not pay for it, and to what extent consumption of a service reduces consumption opportunities available to others
3. *Commoditisation potential*: how easily an environmental service can be translated into a homogenous, measurable “package” that represents the actual service demanded by the market and overcomes the problems of non-rivalry and non-excludability
4. *Demand and supply potential*: existence of enough buyers and suppliers with access to information, evolving demand and supply drivers
5. *Value and significance of the service*: value will in principle be defined as a function of demand and supply; a service can be very important but if its supply far exceeds the demand it may not command much economic value
6. *Locality of the market*: is the market mainly local, or is there international demand
7. *Transaction costs*: easiness of creating a “platform” where buyers and suppliers can exchange information and carry transactions; legal requirements; easiness of verification, accreditation and registration of services; need for organising buyers and suppliers
8. *Scientific uncertainty*: verification of service delivery and linkage between service and management (land-use) action
9. *Risk*: uncertainty regarding that the service will be delivered, permanence of national and international policies (agreements), leakage impacts,

The market feasibility assessment looks at the *potential for international trade and impacts on forest products trade and SFM*. Markets for forest environmental services are still relatively nascent so the question of having considerable impacts on forest products trade, e.g., by expanding the plantation area for carbon sequestration will primarily depend on if any of these markets will take off on a large scale.

This uncertainty about the future extent of markets for various forest environmental services justifies the study’s emphasis on the potential for market development. If these markets will not take off in a significant manner, the question about them having any major impact on forest products trade and SFM may become a “moot” issue. This means that, in principle, the assessment based on criteria 1-9 must precede the assessment of the potential and the impacts on trade and SFM.

3.5.2 Linkages with Trade Agreements and Negotiations

The WTO agreements, including GATT and GATS, do not define “environmental goods” and the definition of “environmental services” is limited to end-of-pipe activities, not explicitly covering sustainable management of natural resources. The coverage of trade negotiations remains uncertain in this respect. Definitions will have implications for the competitive advantage of environmental goods and services, national sovereignty in regulating environmental service and good delivery (sustainable development), and the nature and level of service provision (e.g., marketing of shade-grown coffee or eco-labelled forest products). Definitions may also influence the competitiveness of individual countries in the production of wood and non-wood products.

Carbon, biodiversity and water services of forests may be significantly affected by the Doha Round. As regards carbon, the main issue is the potential conflict between the still-evolving rules for CDM-based emission trade under the Kyoto Protocol and the WTO, particularly GATS. How this potential conflict is addressed could have major implications for how CDM projects are implemented. The potential impacts of including the protection of biodiversity and landscape as environmental services in the WTO definitions are not yet adequately known and stakeholders have different views on them. In the area of water, the key issue has been opening service delivery to international competition. Defining water resource as an environmental service would broaden the view making watershed management an environmental service subject to GATS regulations. However, many definitional proposals are vague and do not allow a ready assessment of their relevance for markets for forest-based environmental services and sustainable forest management.

3.5.3 Potentials, Impacts and Trends in Market Mechanisms and Market Creation

Markets are bringing together a buyer and seller so that they can trade commodities, be they services or goods. Direct transactions are obviously quite different from other market-based mechanisms such as taxation or subsidy schemes. The basic requirements for environmental services markets to develop are that demand either exists or can be created, a price or value can be established for a forest ecosystem service, and that suppliers (landowners, resource managers, etc.) are able to produce and sell this service to buyers. In addition, a link between buyer and seller is required to allow exchange of information and drawing on various sources of funding.

Markets can be defined at local, regional or international level, which has implications for how market failures can be rectified. Environmental services can be traded individually or as a bundled commodity. A whole range of mechanisms exists for market-based transactions but it is obvious that markets are not the sole solution for sustainable delivery of forest environmental services.

A large number of different market-based mechanisms or have been promoted for trading environmental services of forests. They reflect differences in the nature of environmental services or goods and the level of market sophistication.

Various intermediary mechanisms through NGOs, trust funds, etc. are dominating (35% of all the cases reviewed), followed by direct negotiations between seller and buyer (17%), pooled transactions (12%) and over-the counter trades (12%). Other options include investment fund/venture capital, joint ventures, clearing house transactions, auctions, commodity exchange etc. As a whole, market mechanisms for forest environmental services are not yet well developed. Governments, NGOs and various funds, such as GEF, are still playing a central role in intermediary and direct negotiation-based transactions, and spontaneous (free) market formation is less common.

Various mechanisms rely on different degrees of private sector involvement. In the one end of the market continuum, there are *private deals*, which require only a limited amount of public sector involvement. In the other end, public, *non-market transfer payments* for environmental services are applied. In between, one can find formal *public-private sector arrangements* or open private trading based on government-organised markets driven by market regulations (e.g. setting of caps).

The potential of various environmental services for market development varies considerably, because some services lend themselves better for trade, whereas in some cases supply can be best ensured through instruments such as taxation and government regulation. Many factors influence market creation for environmental services such as (i) demand and supply potential, (ii) value and significance of the service, (iii) geographic location of the market, (iv) commoditisation potential, (v) easiness of defining and enforcing a property right, (vi) degree of excludability and rivalry of the service provided, (vii) transaction costs, (viii) scientific uncertainty and verification possibilities, and (ix) risks. The length of the list and the nature of the themes suggest that market creation for environmental services is a complex process.

Carbon Offsets

Under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol a considerable effort has been made to define provisions for carbon sequestration in national greenhouse gas accounting. However, the rules under the Clean Development Mechanism (CDM) are still to be agreed upon. Trade development in the forest based carbon services has therefore suffered from significant uncertainties and remained limited. Nevertheless, there are about 110 projects covering a total of about 5 million hectares of which most are related forest conservation (Table 3.14 on following page).

The situation is expected to change and carbon sequestration will probably be the most significant forest-based environmental service in terms of international trade. New projects would be focusing on the two eligible activities, i.e. afforestation and reforestation.

Activities with regard to 'Land use, land use change and forestry' (LULUCF), properly planned and under right conditions, can both store atmospheric carbon and provide other environmental benefits, such as biodiversity conservation and watershed protection. Carbon market could thus indirectly contribute to the promotion of SFM, based on multiple forest services. However, under the current rules, the Kyoto Protocol "misses" an opportunity to contribute substantially to the protection of biodiversity and

watershed values associated with natural forests in the developing countries, because they are excluded from an international carbon sequestration market. At the same time, an opportunity to provide financial incentives for adopting SFM practises to provide multiple environmental services is not fully utilised.

Table 3.14 ‘Activities Implemented Jointly’ and other carbon sink projects worldwide (2003)

Region	Projects total			Project type								
				Afforestation and reforestation			Combined			Forest protection, conservation and management		
	pcs	ha	% of ha	pcs	ha	% of ha	pcs	ha	% of ha	pcs	ha	% of ha
Latin America	44	4 178 986	84.4	9	180 624	41.2	10	590 433	93.9	25	3 407 929	86.3
Africa	7	519 381	10.5	3	43 381	9.9				4	476 000	12.1
Asia	8	18 400	0.4	3	2 400	0.5	1	14 000	2.2	4	2 000	0.1
Europe	13	63 468	1.3	8	39 348	9.0	1	24 120	3.8	4	63 468	1.6
North America	17	6 168	0.1	11	5 696	1.3	3	472	0.1	3		
Oceania	15	166 513	3.4	11	166 513	38.0	1			3		
International	5						3			2		
Total	109	4 952 916	100.0	45	437 962	100.0	19	629 025	100.0	45	3 949 397	100.0

These figures are based on data provided by projects, and may not always be accurate. For some projects no area data was available.

Forest Biodiversity

Protected areas, bioprospecting rights and biodiversity-friendly products are the most common commodities based on the number of cases applied (Landell-Mills & Porras 2002). Other commodities include commercial debt-for nature swaps, conservation easements and conservation concessions, biodiversity credits and tradable schemes of biodiversity offsets. Unfortunately, there are no financial statistics on the relative market share of private/non-state sector purchase of biodiversity services, let alone the respective shares of various market-based instruments.

Promotion of integrated conservation and development projects operating in *state-owned protection areas* has been one of the most common ways of trying to conserve forest biodiversity. The other commodities are quite small in relation to protected areas especially when looking at the areas involved. The management of these areas has been traditionally financed by the public sector but complemented, especially in developing countries, with non-state sector financing through NGOs and international (semi-NGO) conservation organisations.

The interest in *biodiversity prospecting* is driven by the potential value of genetic information that could be used e.g. by the seed industry to improve productivity or resilience against diseases, or by the pharmaceutical sector to develop new products. Since the 1980s more than ten bioprospecting deals have been struck, some of them well-documented (e.g. between INBio and Merck in Costa Rica, and Medichem Pharmaceutical and the State of Sarawak). Despite the great values (possibly USD 75-150 billion per year) involved in the nature-based pharmaceutical sector, most of this value has not been translated into significant bioprospecting value. Industry’s willingness to pay for access to biodiversity is low (Aylward 1993, Simpson *et al.* 1994, Barbier & Aylward 1996, Laird & ten Kate 2002). Most of the value is generated during the R&D process.

Marketing of *biodiversity-friendly products*, such as shade-grown coffee or cocoa, which protect indirectly forest biodiversity, is a rapidly growing sector. The global market for “sustainable” coffee is estimated at USD 455 million, of which the North American market accounts for between USD 152 and 188 million. The share of shade-grown coffee represents 1-2 percent of the total market. Consumers’ willingness to pay a modest price premium for organic and shade-grown coffee is well established. (CEC 2001).

The proliferation of market-based schemes and data on increased private sector financing for delivery of biodiversity services suggest that these markets have grown very rapidly recently and that this trend is likely to continue. There are powerful demand drivers in the play that support this conclusion:

- increasing public awareness about the importance of biodiversity will enhance people’s willingness to pay for conservation,
- economic growth and increasing income levels (mainly in developed countries) contributing to the willingness to pay for biodiversity services,
- increasing scarcity of biodiversity due to deforestation and forest degradation
- limited resources of governments address biodiversity problems,
- increasing private sector investment into biodiversity for a variety of reasons

The main supply drivers are innovative efforts aimed at commoditising biodiversity and development of new payment mechanisms that reduce transaction costs. As a whole, the supply of conservation opportunities still far outstrips the willingness to pay for conservation. High levels of competition in supply, i.e. between projects available for funding, and relatively low competition in demand, tend to push the payments for conservation low, barely above the opportunity cost of land. This suggests that more emphasis should be paid to measures that strengthen the demand-side to enhance competition and willingness to pay for biodiversity.

Watershed and Soil Protection Services

Watershed and soil protection services are one of the first forest environmental services that were seen to have potential for market-based transactions. The basic notion, where upstream action generates benefits downstream, and the beneficiaries pay for the service, is easy to understand and can be readily accepted.

In pure physical terms, the supply of watershed services from forests is very large. In a study carried out by Revenga et al. (1998), where a watershed or river basin were defined as the entire area drained by a major river system or by one of its main tributaries, the watershed area represented 55 percent of the world's land area (excluding Antarctica).

Forests are associated with a range of services delivered at a watershed level. The cases reviewed by Landell-Mills & Porras (2002) highlighted five of them:

- water flow regulation: maintenance of dry season flows and flood control;
- water quality maintenance: sediment load control, nutrient load control (e.g. phosphorous and nitrogen), chemical load control, and salinity control;
- erosion and sedimentation control;
- land salinisation reduction/water table regulation; and
- maintenance of aquatic habitats (e.g., maintaining water temperature, shading rivers/ streams, ensuring adequate woody debris in water).

The existing markets for watershed services are, however, modest and local, often involving watersheds that supply nearby urban or rural settlements. Typically, payment schemes are confined within national boundaries. Watershed services are marketed through a number of different mechanisms. For analytical purposes they may be grouped into the following categories using a slightly modified version of the typology developed by Powell and White (2001): (i) self-organised private deals, (ii) centrally managed private schemes, (iii) trading schemes, and (iv) public payment schemes.

Self-organised deals with little or no government involvement have emerged in selected locations and situations. For example, private interests may need water quality or flow that goes beyond regulatory standards, or where there is no effective regulatory system in place. Financing is from private sources but may take various forms as user fees, transfer payments, land purchases, cost sharing arrangements, and/or low interest credit (Johnson *et al.* 2002).

In *centrally managed private schemes* there is no direct link between buyers and sellers. This type of arrangements are found in the United States, where independent trusts are funding conservation easements on private land relying on support from private and corporate sponsors. Negotiations with landowners are handled centrally by the trusts without direct involvement of the funding partners. Deals may also be concluded without any contributions from the direct beneficiaries. Site selection is based on multiple criteria, and protection of watershed functions is frequently only one of several objectives.

In a *trading scheme*, government sets an upper limit or “cap” on the total emissions of particular pollutants, in this case sediment load or runoff. Individual facilities or landowners have a defined maximum allowable amount of emissions they can release, known as “credits”. If a company or landowner finds they can easily meet their allowable limit, they can then sell their excess credits to other entities, which can not meet their limits as easily or cheaply. Trading emission credits enables companies and landowners to make economic decisions as to whether it is cheaper to lower their emissions or to buy credits from others who have been able to do so. Regulators in effect do not care who takes action so long as the overall standard is met or the cap is not exceeded (Johnson et al 2002, Conservation Finance Alliance 2003). The reasons for the limited coverage of trading schemes may relate to the difficulties in benefit valuation, or the low competitive edge of forests in providing watershed services. It appears that the watershed protection measures undertaken under the various trading schemes tend to take place on agricultural land (e.g. Environomics 1999).

Public payment schemes are where government or a public sector institution pays for the ecosystem service. Of the three categories of financial mechanisms, public payment schemes are the most predominant in the world today. The financing can come from various sources including general tax revenues, bond issues, or user fees. Payments are made to private landowners and private or public resource managers. Public payment schemes also have the largest geographical coverage. The largest schemes in global terms are found in the United States, China, and Vietnam. The future development of markets for forest-based watershed services is subject to many uncertainties. Currently, the main drivers behind demand are the failure of regulatory measures to accomplish adequate protection of watersheds, and continued degradation of watersheds, which is increasing their scarcity. It is therefore likely that the market expansion will continue.

A number of factors are constraining demand, in particular lack of scientific evidence on the contribution of forests to watershed services. While the perception that forests have a number of positive impacts on watershed protection is widespread, there is limited scientific evidence to support it.

While the total area of the world’s watersheds is large, only a fraction of them could become part of environmental service arrangements. If the current projections of increased scarcity materialise, watershed services will gain substantially in value and give a boost to the development of market-based watershed mechanisms.

Landscape Beauty and Recreation

Markets for landscape beauty and recreation have existed for a long time, and they are intimately linked with amenity values and development of tourism and recreation. In the past the focus was on landscape objects but more recently, the value of broader landscapes for local people and tourism has been recognised, and these values are being brought under protection. There is clearly an increasing demand in some of the wealthier countries.

The demand for landscape beauty is mainly based on development of tourism. International tourist arrivals have grown by 7% a year since 1950 (WTO 2000) and nature-based tourism has increased even faster. In the future international tourist arrivals are forecast to grow 4.1% annually until the year 2020. Regarding nature tourism, the World Resources Institute estimated in the beginning of 1990s that it was growing between 10-30% a year. TIES has estimated (1999) that nature-based tourism comprises 20% of the world travel market, and ecotourism 7%. Tourists travelling abroad were estimated to have spent USD 166-260 billion in 1994 (Ecotourism ... 2003).

UNEP (2001) has identified *inter alia* the following trends affecting the development of nature-based tourism:

- Across the globe people are increasingly concerned about social injustices and environmental problems, and protected areas are well placed to take advantage of this trend
- Educational levels are rising, and higher educational levels are strongly correlated with demand for outdoor recreation activities (hiking, cycling, kayaking etc.)
- The expansion of long-haul air travel will increase global demand for protected areas, which often feature among main destinations for international travellers
- In wealthy countries, expanding number of retired people with good savings increases tourism in general
- Rising living standards increases demand for high-quality services
- Changes in leisure time vary; in a number of countries leisure time during working life is restricted guiding demand towards short-term, easily accessible services. On the other hand, longer paid vacations in Europe and in a few emerging markets lead to an overall increase of demand.

Key mechanisms for the valorisation of landscape beauty are (i) fee-based mechanisms; (ii) mechanisms involving private sector and local communities; and (iii) mechanisms for protection of landscape:

- *Fee-based mechanisms:* Protected areas cover 1 280 million ha, or 9.5% of the total land area of all countries (World Commission on Protected Areas 2003). Protected forest areas alone are estimated to occupy 480 million hectares, 12.3% of the total forest area (FAO 2000). While not all protected areas charge fees, they are widely used, and it is therefore believed that this is the most significant payment mechanism for landscape beauty among the three types of arrangements referred to above.
- *Mechanisms involving private sector and local communities:* Tour operators play a central role in the markets for landscape beauty. While consumers usually pay for nature-based services, intermediary tour operators that provide access to these services have contributed little to their maintenance. For instance, a study carried out in Australia on five major national parks indicated that user fees collected by them amounted only to 0.3% of total tourist expenditure in and around them (Driml and Common 1995).

No global statistics are available on the development of community-based tourism, but given the proliferation of cases presented in the literature, the number of such enterprises is undoubtedly large. However, generalisations are difficult because of large variation in natural conditions, attraction level, affected area, number and type of actors, etc. For instance, in the reviewed cases the area affected by community-based tourism reportedly ranged from 8 600 ha to 600 000 ha.

- *Mechanisms for protection of landscape:* Europe and the United States are at the forefront of applying market-based mechanisms to protection of landscape. Within the European Union *inter alia* the UK, Germany, Austria and Sweden have embraced the concept of protecting traditional cultural landscapes, and provide compensation to landowners for benefits they forego because of protection.

The principal European programmes for landscape protection are focused on agricultural activities, but where forest is an integral part of the landscape, landowners may also be compensated for restrictions imposed on forest management. A few afforestation schemes also include landscape protection among their objectives. For instance, the objectives of the Farm Woodland Premium Scheme (FWPS) in the United Kingdom are to enhance the environment through the planting of farm woodlands, thereby improving the landscape, providing new habitats and increasing biodiversity. Since 1992 about 35 000 ha have been approved for planting (DEFRA 2003).

The overall growth of nature-based tourism will provide increased financing to protected area management, but the present trends suggest that government budgets will remain the main source of revenue, at least in the short and medium term. However, the market for landscape beauty is large and expanding. Given the rapid growth of nature-based tourism, the problem lies less in market creation than in ensuring that protected and conservation areas are able to capture a fair share of the benefits associated with this development.

The supply of landscape beauty through subsidy systems similar to those applied in Europe is subject to controversy and may be restricted in the future. This issue has been raised in the current round of WTO negotiations and the United States, and the developing countries have challenged them suggesting that such payments are an indirect subsidy to agriculture.

3.5.4 Verification and Certification

The expansion of markets for other environmental services will require verification to achieve adequate credibility of the service delivery. Independent third-party certification would help land managers garnering public confidence and credibility, and also payments for services call for transparency and accountability. Private investors or other beneficiaries will want to know that they get what they pay for. On the other hand, verification/certification would add to the transaction costs, and consequently reduce the market opportunities.

Certification of environmental services would make sense especially when bundled services are provided, i.e. in the case of joint production of different environmental services from forests. This would reduce transaction costs and, at the same time, facilitate marketing of multiple services. Linking verification of environmental services with SFM certification is another option to reduce transaction costs.

3.5.5 Impact of Environmental Services on SFM and Trade

Markets for forest environmental services are still relatively nascent so the question of having considerable impacts on forest products trade (e.g. plantations for carbon sequestration) will impinge on if any of these markets will take off on a large scale.

Carbon offsets from forests have the best potential to become a globally traded environmental service. With regard to impacts on trade in forest products, reforestation and afforestation projects will expand the timber supply, mainly in tropical countries, and to a lesser extent, the energy cost effect will influence the location of processing industries. The available projections for demand of forest-based carbon credits in the first commitment period suggest that under specific circumstances carbon plantations could increase wood supply to the extent that it would affect timber price at regional level. Use of bioenergy promoted by the provisions of the UNFCCC and the Kyoto Protocol will increase wood demand for this purpose giving a boost to efficient use of forest harvest and processing residues.

The upper level of the LULUCF-CDM market during the first commitment period would be about 600 Mt CO₂ equivalents (excluding the United States). A more realistic level of trade during the same period would be 110 Mt CO₂ equivalents, representing a possible global market value of USD 876 million depending on the unit price. Were new plantations established primarily in sub-tropical regions, this would amount to some 14 million hectares in total. If the entire area were industrial plantations, they would potentially supply a timber volume representing 3-5% of the current global production of industrial roundwood and pulpwood. This volume would be large enough to affect timber prices at least on a regional level.

The current cap imposed on afforestation and reforestation under CDM would allow more than a five-fold increase in plantation area compared to the above projection. However, other factors such as higher political risks in developing countries, unsustainable land uses, high opportunity cost of land, problems with insecure land rights, weak enforcement, etc. may reduce the interest in LULUCF projects. On the other hand, if the expansion to such an extent proves feasible, a large share of the new forests would probably be established in tropical developing countries. This would lead to a substantial increase in supply, and probably depress timber prices globally, which again may reduce the overall planting rate because of reduced profitability.

The impacts will be first observed in Latin America followed by Asia. Africa would require special support to have access to carbon offset trade.

Forest plantations will be favoured, because during the first commitment period (2000-2012) one can credit only afforestation and reforestation projects. Further, non-Annex I countries do not have caps concerning emissions resulting from reductions in forest carbon stock. Such impacts may be exacerbated in the second and subsequent commitment periods by inter-annex leakage resulting from decreased timber harvests in industrialised countries. During the first commitment period this impact will be small.

Uncertainty regarding treatment of leakage and LULUCF rules concerning natural forest management and avoided deforestation leaves during the second and subsequent commitment periods a number of options open with different implications for trade; these need to be studied in more detail before firm conclusions and recommendations can be made.

The incremental impacts of other environmental service markets (biodiversity, landscape beauty, and watershed management) on wood supply and prices, and thus on international trade flows, are likely to be insignificant. However, local impacts can be important, including closing of production facilities because of reduced wood supply. The emerging markets for forest environmental services will offer an opportunity for low-income forest owners and managers to benefit economically from good husbandry or stewardship of their forest resources.

Additional revenue from environmental services will make SFM economically attractive in many locations but may not give a major boost for improved practices due to limited market sizes. Direct payment schemes for *forest biodiversity services*, including conservation concessions/easements and private conservation funding, are expected to have the most positive impacts on SFM in incremental terms. Other mechanisms will have positive impacts to a varying degree, depending on how closely the marketed commodity is related to the environmental service itself. However, most market-based mechanisms will mainly influence the sustainability of already existing forest conservation areas. The challenge is to turn the increased revenue flows to incentives for resource managers to adopt more sustainable practices.

Markets cannot develop and operate without government interventions. In fact, international environmental agreements/regulations have a strong potential to increase demand for services generated by sustainable forest management. Markets and regulation are both needed; the question is about the balance between the two, and about the strengths and weaknesses of the market mechanism. Unless market creation for forest environmental services succeeds in generating more revenue than the total market costs, and equitably distributed to the land stewards, the incentives for SFM will not be created.

3.5.6 The case study: Conservation Easements in the USA

Most of the forest land in the USA sold by large paper companies has been acquired by financial investors. Where natural forests are involved, especially in the northeast, the use of Conservation Easements (CEs) has been growing rapidly, and it has come to play a key role in forestland investments both for conservation and for production. CEs now cover about 1 million ha of land in the USA and the area is growing rapidly.

In general, in property law of the US some limited property rights or values may be granted to third parties. In the USA it has become quite common for land owners to sell or donate easements that legally require and guarantee that a property will not be further developed for commercial or residential purposes and that it will remain in its natural condition. It is also possible to guarantee watershed services through CEs, and users can pay fees for these.

This legal amendment to the deed cannot be removed when the property is sold or transferred, so that the guarantee is in principle perpetual. This often lowers the market value of a property, and that difference in value is donated by the land owner for a tax deduction or is paid to the owner by a government entity or by a non-profit or philanthropic organization. Subsequent property taxes are also usually lower, further compensating the land owner. The easements are often granted to and held by non-profit land trusts that inspect properties and take legal or other actions if they perceive violations to agreements. State governments have allocated billions of dollars, and the federal government has allocated hundreds of millions of dollars, to purchase such easements. Foundations are also a major source of funding. A number of major non-profits work to facilitate and quicken the pace of the transactions.

A recent development very important to the subject of timberland investments is the advent of “Working forest” easements. In this case the restriction is that the property cannot be otherwise developed, but that sustainable timber harvesting can take place. As mentioned above, the value of the land itself under timberland needs to be acquired at a fairly low price if the value of growing timber is to repay an adequate return on investment. This is especially true if timber has recently been harvested, and there is a long

waiting period before any commercial harvesting should again take place. A working forest easement facilitates a non-profit group or source of public funds paying for all the potential development values of the property so that a timber investor need invest only that amount which is justified by the future timber sales values. In many areas of wealthy countries (and this is becoming true in middle income countries such as Costa Rica or Thailand) the intrinsic value of land, which is ultimately based on its future development value, is simply too high for a timber growth return to justify the purchase price. In principle, working forest easements make it possible for any land to be devoted to sustainable forestry, if there is a source of conservation funding and a willing investor. And the solution itself is long term if not perpetual. As Best and Wayburn (2001) point out, more forest can be conserved for the same amount of funding with production forests than with protection forests.

There are several sizable recent examples in the northern hardwood forest in New England and New York near the Canadian border that illustrate a form of the process. Over 200,000 ha were involved in three deals in 1999. Large paper companies wish to sell large tracts of forestland that they have owned and operated for many years. (Their motivation was considered above.) Conservation organizations wish to maintain forest cover and protect forest values, especially biodiversity. The state government involved agrees that some of this land should have protected area status, but they would also like to assure that much of the land remains production forest. The state promotes this to maintain or increase economic growth and jobs and to use conservation funding more efficiently. The conservation organization buys the land from the paper company. Some of it is transferred to the state as protected area (often adding it to contiguous protected areas). For other large areas a working forest easement agreement is reached amongst the conservation group, the state and a timberland investor (the new land owner).

The state contributes part of the purchase price of the land to the investor. In some cases the timberland investment organization, rather than the conservation group, has taken the lead, and this is an integral part of their strategy to maximize the return on investment. In discussing the northern hardwood forest of the northeast USA, Best and Wayburn (2001) make the following comments. "The heritage of (industrial forest) properties and the region's economy has been one of 'boom and bust,' tracking cycles of massive harvests followed by reduced activity as the forest renewed itself. The CE requires management that results in a sustained yield of high quality saw-timber, a dramatic change from the fiber based goals of the papermills in the past, and a change that bodes well for the future of the region."

There can be controversy in many aspects of the process. How it is decided which lands are appropriate for protection or production? How will sustainable forest management be defined in a legal agreement? And of course what are the values and the level of prices? However for most large transactions of natural forest land in the United States, easement agreements of one kind and another have become an essential element in the process. It appears that such mechanisms could also work in developing countries with international funding agencies brokering the process. This could help improve the very poor record of establishing sustainable forest management areas in these countries. Rather than relying on government to enforce norms on public forests, which is related to overall government capacity and is thus a long term process, projects could be based on a governmental legal agreement with an investor where non-profit groups could inspect and take legal action for compliance and international or national public funds could provide funding for the environmental services provided.

The above caveats on secure land title and rule of law apply. But if government provided guarantees and international funding agencies took an interest, this would increase investor confidence and lower the perceived environmental risk. It would also reduce the investment required to acquire productive timberland, because public monies would be funding the desired environmental services. Essentially then this is a system, as it now functions in wealthy countries and as it could function in poorer countries that create a public/non-profit/private investor partnership and that provides public funding for environmental services of forests while facilitating private investment in sustainable forest management. It would seem that international funding agencies interested in global environmental benefits might profitably consider experimenting with such mechanisms.

3.5.7 Conclusions and Recommendations

Forest Environmental Services and Market Mechanisms with Potential

The previous chapters have demonstrated the wide range of market-based mechanisms used in commoditising biodiversity, carbon sequestration, watershed management, landscape beauty and bundled services. In

Table 3.14 they are summarised according to the level of public involvement and geographic dimension of the market. Despite the proliferation of various kinds of private payment schemes for forest environmental services, most schemes still rely on active public sector involvement. International transfer payments under the “public transfer payments” category, although sometimes using fiscal instruments, imply mainly a non-market approach (Richards & Moura Costa 1999, Biller 2000).

In terms of the relative size of markets, *international markets* dominate in the carbon offsets, biodiversity and ecotourism. These markets are driven by international demand originating from developed countries. Markets for watershed management services are largely local.

Table 3.15 Market-based Mechanisms by Degree of Public Sector Involvement

	Biodiversity	Carbon	Water	Landscape beauty	Bundled
Private deals					
Domestic	<ul style="list-style-type: none"> • Eco-labelling • Land purchases • Conservation easements • Trust Funds 	<ul style="list-style-type: none"> • National trade • Internal trade within enterprises 	<ul style="list-style-type: none"> • Management contracts, payments for best mgt. practices • Conservation easements • Land acquisition • User fees • Water quality credits 	<ul style="list-style-type: none"> • Forest-based ecotourism entry fees • Conservation easements 	<ul style="list-style-type: none"> • Environmental shares • Conservation easements
International	<ul style="list-style-type: none"> • Eco-labelling • Conservation concessions property rights • Bioprospecting • Patents, licensing • Tradable development rights • Trust funds 	<ul style="list-style-type: none"> • Trading in forest-based carbon off-sets/CDM projects 			<ul style="list-style-type: none"> • Environmental shares • Conservation concessions
Private-public deals					
Domestic			<ul style="list-style-type: none"> • Trading schemes/water quality credits 	<ul style="list-style-type: none"> • Concessions/ entry fees 	
International	<ul style="list-style-type: none"> • Bioprospecting • GEF/Venture capital funds 	<ul style="list-style-type: none"> • Prototype Carbon Fund • Biocarbon Funds • AIJ carbon projects • other similar funds 			<ul style="list-style-type: none"> • Payments for environmental services programmes • Green venture capital funds
Public transfer payments					
Domestic	<ul style="list-style-type: none"> • Various conservation funds • Subsidies 		<ul style="list-style-type: none"> • Water taxes and funds • Payments for management services • Subsidies 	<ul style="list-style-type: none"> • Subsidies 	<ul style="list-style-type: none"> • Payments for environmental services programmes
International	<ul style="list-style-type: none"> • WB, GEF, ADB • GEF, etc. • Bilateral financing • Bilateral funds (e.g. FFEM) • Trust funds • Debt-for-nature swaps 	<ul style="list-style-type: none"> • CDM projects 	<ul style="list-style-type: none"> • Almost the same as under biodiversity 		<ul style="list-style-type: none"> • Various environmental funds

It is difficult to prioritise various forest environmental services in terms of their market development potential because most of the markets are still nascent, and their development faces considerable challenges. There is also insufficient data on the monetary importance of the various types of services and payment schemes and associated institutional arrangements. Furthermore, the importance of markets depends on the adopted perspective. Small markets for localised forest environmental services, such as watershed management, can be crucial for the well-being of the local beneficiaries, providing at the same time needed income for the land owners and managers without having any implications at the national or international levels. Forest-based ecotourism is globally a very important business that, however, appears to have only minor impacts on the sustainability of natural resource management because of the limited financial flows to the actual resource managers. On the other hand, though maybe only 1-4% of the total value would go to the local communities, this additional revenue may be fully adequate to provide incentives to protect the specific area. It all depends on the prevailing context. Despite these difficulties, an attempt is made in **Table** (following page) to summarise the general market development potential of the key environmental services of forests.

In terms of market potential, the following general conclusions can be drawn:

- *Carbon offsets from forests* have the best potential to become a globally traded environmental service, but the current market situation is extremely fluid owing to uncertainties related mainly to international policy. At present, there are some 110 projects covering more than 5 million hectares, including projects under the activities implemented jointly (AIJ) umbrella and other projects.
- *Demand for nature-based tourism* is growing at a rapid pace internationally, regionally and locally. In 1994 tourists travelling abroad were estimated to have spent USD 166-250 billion. It will be important to increase revenue capture from economic activities to the benefit of protected area management.
- There are a number of forest *biodiversity-related services* with differing potential for market development. In general, the potential for major expansion of the market is constrained by problems in commoditisation, and defining and enforcing property rights. Various direct payment schemes, such as conservation easements and concessions, and biodiversity-related nature tourism appear to offer the greatest development potential. Demand for biodiversity-friendly products, such as shade-grown coffee, is also increasing rapidly. Nevertheless, public transfer payments will continue to dominate in the near future, but possibly channelled using new innovative mechanisms, involving also the private sector.
- Market-based arrangements for *watershed services* are currently applied in a limited area. There is considerable potential to expand markets for watershed services mainly locally if the current constraints are removed.

Markets for *bundled environmental services* are expanding, driven especially by developments in the supply and among intermediaries and increasing awareness about the opportunities provided by joint production.

Table 3.16 Marketability of Forest Environmental Services and Their Impacts on Trade and SFM

Attribute of marketability	Biodiversity	Carbon	Watershed protection	Landscape beauty
1. How easily the property right can be defined and enforced	Some aspects can be defined; some not	Easy	Difficult in many cases	Usually easy for specific tourism objects, not possible in landscape protection
2. Excludability and rivalry	In some cases possible	Sequestration no but trade in offset yes	Possible in some cases	Not possible in landscape protection
3. Commoditisation potential	Difficult to develop a measurable tradable proxy	Already done	High potential, if forest-water link can be established	High
4. Demand and supply/Value of the service	In many cases supply still exceeds demand	Both demand and supply will increase	Unclear demand and supply, value of service may be limited	High demand; service provider often capture limited benefit
5. Locality of market	Mainly global; no secondary markets	Global, national, internal	Predominantly local, transboundary markets have not yet emerged	International and local
6. Transaction costs	Can be excessively high	Initially high; can be reduced when trade volume grows and standards are developed	Large number of actors and difficulty of monitoring often make transaction cost high	Low
7. Scientific uncertainty	High. Great local variation	Low, because scientific evidence is strong	Lack of scientific evidence of benefits main problem for market creation	Not an issue
8. Risk	High because of scientific uncertainty and enforcement problems	High, because many issues still outstanding at international and national levels	Scientific uncertainty implies high risk of non-delivery of requested service	Excessive consumption carries risk of environmental degradation
9. Impact on trade	Mainly local positive impacts; however traditional conservation has national and even global impacts	Can have major impact on trade	Insignificant on global level, may have importance at national level in selected countries	Insignificant at national and global levels
10. Impact on SFM	Positive contribution; depends on the mechanism; need to improve the contribution	Likely to increase significantly plantation area; impact on SFM and biodiversity limited unless natural forest mgt. and avoided deforestation qualify	Positive contribution; same as above	Positive though usually small with exception of few selected countries, where impact may be modest

Impacts on Trade and Forest Management

As most of the markets are nascent, waiting for a take-off, they do not yet influence management of forests to such an extent that wood supply and prices would be affected. Even when the markets will take off, the impacts on trade in forest products are likely to remain small and mainly local, with the exception of carbon offset trade based on forest sink projects. Therefore, quantitative analysis of these impacts should be concentrated on carbon mitigation services provided by forests. Any assessment at this stage remains speculative but the following outcomes may be expected:

Impacts on trade:

- Trade in forest products will be affected mostly through timber supply effects associated with reforestation and afforestation projects, mainly in tropical countries, and to a lesser extent through energy cost effect, influencing location of the new investment in processing industries. The possible impact of carbon sequestered in wood products will depend on how it will be accounted for under the Kyoto Protocol.
- The upper level of the LULUCF-CDM market during the first commitment period would be about 600 Mt CO₂ equivalent (excluding the United States). A more realistic level of trade during the same period would be 110 Mt CO₂ equivalent, representing a possible global market value of USD 876 million depending on the unit price. Were new plantations established primarily in sub-tropical regions, this would amount to some 14 million hectares in total. If the entire area were industrial plantations, they would potentially supply a timber volume representing 3-5% of the current global production of industrial roundwood and pulpwood. This volume would be large enough to affect timber prices at least on a regional level.
- The current cap imposed on afforestation and reforestation under CDM would allow more than a five-fold increase in plantation area compared to the above projection. However, other factors such as higher political risks in developing countries, unsustainable land uses, high opportunity cost of land, problems with insecure land rights, weak enforcement, etc. may reduce the interest in LULUCF projects. On the other hand, if the expansion to such an extent proves feasible, a large share of the new forests would probably be established in tropical developing countries. This would lead to a substantial increase in supply, and probably depress timber prices globally.
- The impacts will be first observed in Latin America followed by Asia. Africa would require special support to have access to carbon offset trade.
- Forest plantations will be favoured, because during the first commitment period (2000-2012) one can credit only afforestation and reforestation projects. Further, non-Annex I countries do not have caps concerning emissions resulting from reductions in forest carbon stock. Such impacts may be exacerbated in the second and subsequent commitment periods by inter-annex leakage resulting from decreased timber harvests in industrialised countries. During the first commitment period this impact will be small.
- Uncertainty regarding treatment of leakage and LULUCF rules concerning natural forest management and avoided deforestation leaves during the second and subsequent commitment periods a number of options open with different implications for trade; these need to be studied in more detail before firm conclusions and recommendations can be made.
- The incremental impacts of other environmental service markets (biodiversity, landscape beauty, and watershed management) on wood supply and prices, and thus on international trade flows, are likely to be limited on a global scale. However, local impacts can be significant.

The impacts on sustainable forest management can be summarised as follows:

- Additional revenue from environmental services will make SFM economically attractive in many locations but may not give a major boost for improved practices due to limited market sizes.
- Compared to business as usual, the impacts of *carbon sink* projects on biodiversity during the first commitment period may be limited as only some 14 million ha might be covered by plantation activity.
- There are no reasons to assume that carbon forest projects would have any more adverse environmental or social impacts than other plantation establishment, on the contrary due to the CDM's provisions for sustainable development and biodiversity.
- The current CDM rules favour establishment of fast-growing plantations, which often are monocultures. There is a risk of a leakage leading to expanded harvests in natural forests, which would have negative impacts on biodiversity.

- Direct payment schemes for *forest biodiversity services*, including conservation concessions/easements and private conservation funding, are expected to have the most positive impacts on SFM in incremental terms. Other mechanisms will have positive impacts to a varying degree, depending on how closely the marketed commodity is related to the environmental service itself. However, most market-based mechanisms will mainly influence the sustainability of already existing forest conservation areas. The challenge is to turn the increased revenue flows to incentives for resource managers to adopt more sustainable practices.

Socio-economic Impacts

Due to the large number of various schemes related to markets for forests environmental services and the different contexts where they are being applied, it is difficult to generalise about their socio-economic impacts. Furthermore, most schemes are only pilots, or are relatively recent, so it is too early to make firm and detailed conclusions about their socio-economic impacts. However, this review and other studies have indicated that emerging markets for forest environmental services offer an opportunity for low-income forest owners and managers to benefit economically from good husbandry or stewardship of their forest resources.

In principle, market-based mechanisms are predicated on voluntary transactions between buyers and sellers and should thus benefit all of those involved (Shilling & Osha 2003). All the environmental services have the potential to enhance positive socio-economic impacts or sometimes cause negative impacts. The challenge is to pay adequate attention to equity and socio-economic impacts during both the project (market) design and implementation phases to enhance the positive impacts and minimise negative ones. The envisaged benefits for the poor resource managers are (Landell-Mills & Porras 2002, Cohen 2002, Pagiola 2002):

- Means to increase the income and employment opportunities of the rural poor
- Means to diversify household income sources
- Means to improve livelihoods of people through securing long-term supply of forest products for subsistence use and environmental services such as regular water supply, maintained agricultural productivity
- Improved social capital through strengthened local institutions and community capacity
- Positive development spin-offs in human and physical assets when investments are simultaneously made e.g. in communication infrastructure, training and education to facilitate the establishment and functioning of the markets
- Transfer of additional funds especially from the private sector in the North to the South

The main social and economic costs and constraints to pro-poor market development are:

- Possible marginalisation of weaker groups, e.g., because of eviction from conservation areas or reducing access to traditionally used forests
- Increased service costs, e.g., water fees that can hurt the poorest groups
- Insecure tenure and poorly defined property rights, in general
- Weak power and low degree of organisation as well as inadequate skills and education to participate in the market in “equal” terms
- Inadequate finance, access to market information and communication infrastructure
- High participation costs in market exchange

It is important to acknowledge that the prime objective of payment schemes for environmental services is not to make local people better off but to market environmental services desired by the buyers. Also, there is nothing inherent in the functioning of any markets that would automatically enhance equity. On the contrary, there are reasons to believe that development of markets for environmental services may initially benefit people who have good access to capital and especially to land. The markets are also likely to favour countries that are better off, well organised, and with strong legal systems, including secure property rights. It is possible to make market-based mechanisms to work for both the people and the forests, but it requires concerted co-operation between local stakeholders, government authorities, NGOs, private sector intermediaries and international donor agencies. In Chapter 9.2 some recommendations are made how to enhance the role of markets for forest environmental services in poverty alleviation.

Limitations with Market-based Approaches, and the Role of the Government

Individuals and societies in their decision-making have treated ecosystem services, including the ones derived from forests, too often in the past as free (e.g., Daily *et al.* 2000). However, it is now well understood that many services are not free any more; ecosystem capital is becoming scarcer. Using markets as way of allowing resource managers to capture the value ecosystem assets and internalise the external costs and benefits in their decision-making can lead to profoundly favourable effects in terms of promoting conservation and sustainable forest development.

Despite the significant potential, reflected in the almost exponential increase in the interest in MES, it is important to acknowledge that the markets are not the only solution, or panacea for sustainable delivery of all environmental services. Some environmental services, such as supporting the functioning of natural ecosystems and related knowledge, are very much public goods and do not lend themselves well for market-based development. Also, although markets can, and should be, used to promote environmental purposes, market forces have often resulted in unsustainable practices, overexploitation of timber and non-timber forest products being good examples. Commoditisation of all environmental services for marketing purposes may result in opportunistic behaviour even in a situation, where the services have been provided in the past as a public good without any problems.

Markets cannot develop and operate without government interventions. In fact, international environmental agreements/regulations have a strong potential to increase demand for services generated by sustainable forest management. Markets and state regulation are both needed; the question is about the balance between the two, and understanding the strengths and weaknesses of the market mechanism (Heal 1995). Intelligent design of markets for forest environmental services involves identifying appropriate roles for the private sector (markets), government and other agents within an overall system of environmental governance, and creating incentive systems that impel each actor to play its role effectively and responsibly. A detailed analysis of the respective roles of the markets and state is beyond the scope of this study. Nevertheless, the importance of identifying the optimal package of market and regulatory arrangements is emphasised here to avoid creating an impression of promoting markets as an automatic alternative to non-market alternatives (cf. e.g. Heal 1995, Simpson 1999, Landell-Mills & Porras 2002).

Finally, successful market creation for forest environmental services alone does not automatically turn into sustainable natural resource management and equitable development. Unless market creation for forest environmental services succeeds in generating more revenue than the total market costs, and this “profit” is channelled equitably to the land stewards, the incentives for SFM will not be created (Simpson 1999, Pagiola & Platais 2002, Shilling & Osha 2003). The value of forests is a function not only of the marketed and non-marketed goods and services they provide, but also who has access to them and how the resource managers are allowed to benefit from this access. Unfortunately, these important principles and issues are too often forgotten, when markets are harnessed to guide the production of environmental services from forests.

3.5.8 Recommendations

Recommendations for Consideration at the National and International Levels

The creation of markets for forest environmental services will require a number of measures by *national governments*. Many of the action needs, such as clarifying property rights, are similar irrespective of the environmental service, and in fact, form part of an enabling environment for sustainable resource management in general. However, due to a large variation in the nature of the provided services, the pre-conditions for successful market development have also differences.

- Improve property rights and responsibilities associated with a specific ecosystem service, including drafting of new legislation, seeking legal opinions, developing property right registries, and enforcing property rights to ensure adequate excludability.

- Define caps and stricter environmental standards, where appropriate, to introduce scarcity, and thus promoting market creation
- Provide financing for pilot projects, facilitating the formation of markets, and analysing lessons learned and incorporating them into policies and national programs
- Establish appropriate governance structures and helping to establish market infrastructure, rules, procedures, verification and enforcement systems as well as intermediaries to help with market development and operations
- Remove perverse incentives that distort markets for forest products and environmental services and encourage the loss of forest benefits.
- Develop national trade policies and other market instruments that could promote environmental services, either as individual commodities or through a bundled concept.
- Support development of service provider associations and user groups, and developing a platform, where they can interact
- Increase willingness to pay and reducing the asymmetry of information by disseminating information on the value of forest environmental services and action needed to secure the supply of the service
- Undertake/fund relevant research (see recommendations concerning research)

At the *international level*, the following measures are recommended:

- Reduce sovereign risk in markets for forest environmental services by clarifying and agreeing on the basic rules for trade, including the measurement and verification methods and treatment of additionalities and baselines, leakage and permanence³².
- Define forest environmental services under the WTO agreements as this will have impacts on demand for services and thereby for their property and use rights. The key issue is the potential conflict between the interests of local stakeholders and those of external investors and beneficiaries.
- Agree whether payments made by the public sector for environmental services (e.g. for biodiversity or landscape) are considered subsidies (falling under the WTO Subsidies Agreement), or remuneration for verifiable services produced by land-owners.
- Explore the possibility of developing standard approaches to verifying the delivery of environmental services, using similar approaches as adopted in certifying the sustainability of forest management.
- Consider the need to subject provision of forest environmental services to sustainable development, and, if deemed appropriate, develop methods to operationalise it.
- Agree on how environmental services, especially carbon credits, should be classified in international trade (statistics).
- Continue support pilot projects but put more focus on Africa, Southeast Asia, and countries-in-transition. Until now, only few, mainly Central American, countries, have benefited from pilot projects to develop MES.
- Study the positive and negative impacts of including the management of natural forests and avoided deforestation, as well carbon sequestered in harvested products, under the Kyoto Protocol.
- Create a clearing-house to exchange information (best-practice market-based mechanisms, successful pilot projects, market information, databases, publication, links, etc.) on markets for forest environmental services. This clearing-house could be combined with a clearing-house for innovative financing mechanisms for SFM.
- Carry out a study aimed at quantifying the flows of public sector and private sector payments for forest environmental services, and developing a monitoring system for keeping this information regularly updated.

Recommendations to Enhance Poverty Alleviation Impacts of MES

The main measures to enhance the participation of poor land owners, resource managers and rural dwellers in these markets and to fairly benefit from MES opportunities are the following:

- Secure land tenure and designate property rights for all products and services associated with the land resource, including recognition of community property systems where appropriate

³² Although discussion on these aspects has until now concentrated on carbon offset trade, they are also relevant for other services if their markets are to be expanded significantly.

- Develop clear rules for project design, that would include assessment of social impacts and adequate participation of local groups in project design and implementation
- Establish or introduce intermediary organisations to help the forest owners to participate in the market through provision of training, research, monitoring, and marketing services
- Develop ways of reducing transaction costs and risks, e.g., by helping farmers and communities to organise themselves and establishing intermediaries to help selling environmental services produced by a large number of smallholders/communities
- Improve access to markets for environmental services and finance by carrying out research, establishing market support centres, introducing special funds, strengthening financial intermediaries, etc.

Pro-poor market development of environmental service markets can be facilitated and poverty reduction impacts enhanced, were such projects were implemented in co-operation with other development efforts. Many of the measures needed to create the pre-conditions for environmental markets are the same activities, which create conditions for sustainable rural development and natural resource management in general, reducing thus the overall costs for market development.

Priority Areas for Research and Development

In the following, the main research needs from the viewpoint of market creation for environmental services from forests are identified by key themes.

- *Accelerate research on valuation of environmental assets and services and their demand.*
 - Conducting valuation studies of environmental services provided by forests and relating these to the opportunity costs of foregone land-uses to help with pricing
 - Carrying out demand studies for various environmental services to better understand the demand function, e.g., for specific conservation areas to improve the pricing of the service
 - Developing equitable and efficient payment schemes that “internalise” the “externalities” and pay attention to the quality and quantity of services provided by different land properties and take into account trade-offs when joint (bundled) services are provided
- *Initiate research on regional and national aspects of MES and their impacts on trade in forest products*
 - Providing detailed and localised estimates of the potential to contribute to carbon mitigation through forestry related measures, paying attention to financial profitability of the these investments and other factors that may affect feasibility
 - Carrying out studies looking into system-wide adjustments, considering (i) increased storage of carbon in harvested wood products, (ii) impacts of increasing wood supply on prices and thus on incentives to expand plantation areas, and (iii) leakages caused by converting forest land to agricultural land and between both Annex I and non-Annex I countries and natural forests and plantations

- *Improving the understanding of supply and demand relationships for environmental services from forests.*
 - Determining scientifically the linkages between forest management and flow of environmental services from forests in a situation, where services are produced jointly
 - Developing ways to integrate biodiversity conservation, watershed management and carbon sequestration in natural forests into a bundled service
 - Quantifying the relations between water quality, flow regulation, sediment prevention, water supply and aquatic productivity based on various land-use practices
- *Supply studies focusing on transaction costs.*
 - Developing mechanisms for commoditising environmental services so that the commodity's nature and extent is unambiguous, and its delivery and use can be measured and enforced at a reasonable cost
 - Identifying ways of decreasing the most critical transaction costs, paying special attention to the potential of developing markets for bundled services, and improving the distribution of these costs so that the incentive framework is improved.
- *Develop standard verification and certification tools applicable to environmental services from forests*
 - Identifying appropriate measures of service flows and developing monitoring, verification and certification methods for them
 - Standardising watershed service definitions and measurement
 - Developing low cost certification systems for forest environmental services, building on already existing forest certification schemes
- *Studying the cost-effectiveness of various market-based mechanisms used to pay for forest environmental services.*
 - Comparing the cost-effectiveness of various mechanisms (including government service delivery), paying attention to the distribution of costs and benefits among the stakeholders
 - Studying the incremental benefits from applying these mechanisms to see if they really make a difference in the behaviour of producers and consumers
 - Identifying the pre-conditions, which need to be put in place to improve the functioning of these mechanisms
 - Identifying those conditions, where the responsibility for delivering an environmental service could be delegated to a market, and identifying the role that the government needs to play in setting up, regulating and promoting market-based transactions
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Public Policy Instruments, Industrial Development and Finance

Chapters and Sections:

- 4. Public Policy Instruments, Rural Development and Forest Industry Development**
 - 4.1 Framework for analysing trade, policy and forest management interactions**
 - 4.2 Extra-sectoral influences and factors**
 - 4.3 Policy Instruments and Processes Affecting Trade in Forest Products and Services**
 - 4.4 Developments in Forest Based Industry Sector**
 - 4.5 Investments and Capital Movements in Forest Sector Issues**
 - 4.6 Innovations in Timberland Investments – the case of the USA**

- 5 International Regime on Trade and Environment**
 - 5.1 An Overview of the Regime**
 - 5.2 Policy Issues, Instruments and Processes**

4. Public Policy Instruments, Rural development and Forest Industry Development

4.1 Framework for analysing trade, policy and forest management interactions

In order to understand the implications of trade for forest management, it is necessary to consider how forests and land use alternatives are valued in different geographical locations. This requires an understanding of the different stages of forest development and of the factors that drive progression from one stage to the next. The extent of trade and the outcomes of trade depend very much on the stage of forest development. The effectiveness of forest policies and processes in tackling forest management problems and the degree to which they are impeded or reinforced by changing trade patterns and policies can also be closely related to the stage of forest development. Each stage of forest development is characterised by a unique competitive balance between forests of different types and between forests and other land uses. The effect of trade and of policy interventions of different types is to alter this competitive balance with implications for the area under forest and its quality of management.

4.1.1 Patterns of Forest Development and Determining Factors

The values that people attach to forests within the current market context are ultimately revealed in their land use decisions. Forest land use is more complicated than many other land uses as it involves activity in three types of area, managed forests (which can include industrial forests and forest plantations, more scattered trees in residential areas and well-managed agroforestry), degraded open access forests, and the unmanaged, mature and natural forest frontier. There are environmental and social effects from forest land use in all three areas. Managed forests are affected directly by activities such as tree planting, timber stand improvement, and harvesting. Harvests from the other two areas affect the incentives for forest management indirectly by producing substitute woody material and, thereby, replacing the demands for, and postponing the development of, managed timber stands.

The problem for forest analyses which seek to describe and interpret these patterns of land use is all the more complex because not all regions contain all activity types. Some developed regions contain both managed stands and natural forest frontiers but very little degraded forest. Other developed regions contain neither plantations nor degraded open access forests, and their harvest activities only occur at the mature natural forest frontier. Some less-developed regions contain only mature natural forest frontiers and degraded open access forest. And other regions in less-developed countries contain plantations, degraded forests, and mature natural forests.

Trade in forest products in general, and in timber in particular, can affect different regions and socio-economic groups differently and it is necessary to understand an entire spectrum of potential causes and effects. In turn to assess the impact of various types of policy intervention, whether forest-related, trade-related or extra-sectoral, it is important to understand these different effects.

4.1.2 Analytic Methodology: Forest Frontier Approach

A model developed by Hyde (forthcoming) relates the pattern of forest development in different regions to three functions, the value of land in agricultural use, the value of land in forestry and the cost of obtaining and protecting property rights to land and resources. All three functions are in turn dependent on accessibility. The agricultural and forest land values decline as the distance from the nearest market access point and/or cost of transport increases. The costs of establishing and maintaining property rights are also heavily influenced by the distance from the market as this reflects the level of public infrastructure and effective control by public institutions. Further detail on this model is given in Annex 1.

Three different stages of forest development can be distinguished:

- Stage 1 – a new forest frontier region
- Stage 2 – a developing frontier
- Stage 3 – a mature frontier

In a new forest frontier region, the value of land in agriculture exceeds the value of land in forest up to the point where distance from the market makes any type of exploitation uneconomic. The abundant forest resources initially have little value compared with agricultural land. Where trees interfere with agricultural production they are removed. Settlers remove trees wherever the value of new agricultural land plus the value of the trees in consumption (for example, for construction timber or fuelwood) exceeds their removal and delivery costs. Otherwise the trees are left standing. It is thus agricultural values which determine the land use pattern at this stage.

This stage characterises for frontier settlement in many parts of South America, migrant settlement in Sumatra in Indonesia, new upland migration in the Philippines and subsistence settlements in Zambia, for example, in the latter 20th century.³³

In a second stage of forest development, a developing frontier, demands for construction timber and fuelwood may make open access wood harvesting viable in areas that are too removed from the market to have value for agriculture. The forest will be degraded to the level where the expected returns from harvesting are less than the opportunity costs of the labour and capital used in their extraction.

Both deforestation and degradation are greater in regions where the opportunity costs of extraction are smaller (e.g. in poorer countries where wages are lower and labour is the largest component of logging costs). Illegal logging will be exceptionally difficult to control because the smaller scale logging operations operated by such labourers are more difficult to monitor and because the returns to illegal activities are greater than the risks of getting caught for those lower wage individuals who engage in them. This description characterises the poorest rural areas of many developing countries today, including for example the southern two-thirds of Malawi and portions of Tamil Nadu in India, of Nepal's hills, and of China's dry and remote Qinghai province. The open access region is unusually degraded in these examples.

In a third stage of forest development, a mature frontier, the distance of the open access natural forest from the market becomes so great and local prices become high enough that intensively managed forests on land with protected secured rights closer to the market become competitive with timber harvesting from the mature natural forest. Prices have not risen sufficiently to induce intensive forestry in all of the markets of the modern world, but there are plenty of examples where they have (e.g. the large plantation areas in Chile, China, India, Japan, South Africa, Southern Brazil and Western Europe to name but a few).

4.1.3 Analyzing the Impact of Trade and Policy Interventions on Forests

Regions in stage I are lesser participants in external trade of any sort, and the forest products they do trade are not transported very far. For trade in extractive products such as industrial timber, we can focus on regions in stages II and III of forest colonisation. The origin of these products may be from intensive or extensive managed forestry for regions in stage III, and from both open access resources or the mature forest frontier in either stage II and III. As we previously suggested, open access resources and the mature forest frontier will be a more important source of industrial wood in regions of developing countries where the population is still low and the institutions affecting property rights are not as well developed.

The impact of trade on forest will be uncertain – almost no matter what the initial condition of the forest in the two trading regions. All trade affects forests in more than one region, and trade often creates net global environmental gains. This can be demonstrated through considering the case of trade between two

³³ Chomitz and Gray (1996), Lopez (1997), and Amacher *et al.* (1998) provide econometric descriptions of agricultural settlement and conversion of the modern forest frontier in Belize, Cote d'Ivoire, and the Philippines, respectively. Heydir (1999) provides an historic description of forest use in Sumatra that extends into a description of settlement on the modern frontier.

regions that are both in the mature third stage of forest development. Trade in sawnwood from Finland to Germany or from south-eastern Canada to the US northeast are examples. After their markets become open to trade, consumers in the first or importing region recognise that they can decrease costs by purchasing from the exporting region. These consumers are now willing to pay only the new lower price for forest products. This means that the value of forestland declines in the importing region and this region's own output of forest products declines. Prices rise to a new higher equilibrium level in the exporting region because of the increased demand from new consumers in the importing region. The value of forestland increases and the second region's output of forest products also increases.

Loggers in the importing region may continue to extract timber from all of their old harvest sites as long as the existing capital and infrastructure are in good condition and the revenues from their harvests cover the variable costs of the logging operations. However, over time the declining price in the importing region must cause these loggers to decrease their level of the harvesting, allowing some land to be converted to other land uses, allowing some forest recovery in the open access lands, and delaying some harvests from the mature forest frontier. At the same time, increasing prices in the exporting region must encourage an expansion in the area under forest management in this region, and additional extraction from the open access lands and from this second region's natural forest.

The net effect of trade on land use in the combination of the two regions is uncertain. Harvests from low cost but highly productive managed forests in the exporting region may replace harvests from the natural forests of the importing region. Most would see this saving of natural forest as an environmental improvement. On the other hand, managed forests tend to be more costly while harvests per land unit tend to be greater from mature natural forests. Therefore, trade may cause a net shift that favors relatively greater reliance on the exporting region's natural forests. Most would see this as an environmental loss. Either is possible. The only certainty is that there will continue to be some harvest activity from the mature natural forest frontier in the exporting region—because its costs of production are low and perfect restriction of all illegal activity on this land is very costly.

This characterisation of trade between two regions in the mature stage of forest development is only one of four possible cases. Another frequent occurrence is trade from regions in stage II to regions in stage III (e.g. the many tropical countries in Africa, Asia and Latin America that ship logs to developed countries). Two regions both in stage II can engage in trade (e.g. the shipment of logs from Cambodia to Thailand is an example). Regions in stage III can also export to regions in stage II (e.g. the shipment of wooden furniture from China to numerous developing countries).

Table 4.1 summarises the effects on forest management, on the degraded open access lands, and on the unmanaged natural forest for all four possible cases. The first conclusion to be drawn from Table 4.1 is that there are always positive effects on consumer welfare in both the importing and exporting region. A second conclusion is that there will always be growth in employment and production in the exporting region. Net growth is also normally assured because the overall lower prices mean that aggregate demand increases and, with it, aggregate production must increase as well. In fact, consumers always gain in the importing region. There would be employment losses in this region but they may be temporary, lasting only as long as it takes unemployed loggers and other woodworkers to find alternative employment. Employment and production always increase in the exporting region and they increase more than they decline in the importing region because the overall lower prices mean that aggregate demand increases and, with it, aggregate production must increase as well.

Table 4.1 Effects of trade on consumers, employment and production and forest management by importing and exporting region

Case	Effect on	Importing region	Exporting region	Net effect
A. Stage III region imports from stage III region	Consumers	gain	uncertain	gain
	Production and employment	decline	expand	gain
	Managed forest	contract	expand	uncertain
	Mature natural forest	recover	contract	uncertain
	Degraded forest	recover	degrade further	uncertain
B. Stage II region imports from stage III region	Consumers	gain	uncertain	gain
	Production and employment	decline	expand	gain
	Managed forest	n.a.	expand	expand
	Mature natural forest	recover	contract	uncertain
	Degraded forest	recover	degrade further	uncertain
C. Stage III region imports from stage II region	Consumers	gain	uncertain	gain
	Production and employment	decline	expand	gain
	Managed forest	contract	n.a.	contract
	Mature natural forest	recover	contract	uncertain
	Degraded forest	recover	degrade further	uncertain
D. Stage II region imports from stage II region	Consumers	gain	uncertain	gain
	Production and employment	decline	expand	gain
	Managed forest	n.a.	n.a.	n.a.
	Mature natural forest	recover	contract	uncertain
	Degraded forest	recover	degrade further	uncertain

n.a.: not applicable

The impact on forest management of trade is more complex to determine because of the different types of forest involved and the fact that trade affects the environment of the importing region as well as the environment of the exporting region. The important environmental question is whether the reduction in forest activity in the importing region is more environmentally beneficial than the environmental loss caused by the increase in forest activity in the exporting region. For this reason, the net effects of trade on the combined forestland of both regions are uncertain. The land area under forest management increases unambiguously only for the case of imports to a region in stage II from a region in stage III (case B in Table 4.1). The effect of trade on the natural forest is ambiguous in all cases.

Furthermore, the ambiguity only increases as the analysis is extended from two regions or countries to global trade. Global trade—for almost any industrial wood product—undoubtedly includes regions and countries that fit the descriptions of each of the four cases. The sum of many uncertain cases is surely only more reason to be uncertain about the net effect on the world's forestlands. The available data are physical, not economic, and the economic measures of managed forests, degraded forests, and natural forests vary from market to market. Many countries contain multiple wood markets—or regions. Therefore, the physical data within each national forest survey can only provide a loose impression of what is happening at each economic margin.

Even that impression would be subject to change as logging technologies, utilisation technologies, and rural infrastructure (especially roads) change. This is a crucial point because these rates of technical and

institutional change can exceed the growth rates of commercial plantations and they certainly exceed the growth rates of mature natural forests. Technical and institutional change can be the most important determinants of trends in the preferred species and size classes of industrial wood over the long run. They explain why loggers return to harvest in already degraded forests. The dominant type of technical and institutional change—roads, mill utilisation, or logging utilisation—is the common source of the most important shifts in long-run land use margins for most regions and countries.

Governments intervene in the forestry sector in cases where markets alone fail to create socially desired levels of production and allocation. Traditionally, the motives for intervention have been to ensure long-run timber supply and to promote employment and regional development. More recently, the policy objectives have expanded to address environmental concerns including the provision of global environmental services and social concerns such as community development. Other stakeholders such as NGOs and the private sector have also started to play a role in introducing policies to achieve these broader objectives. Policies in other sectors however, may have a greater effect on forest management and on how trade influences this.

These interventions in the forest sector, trade and in extra sectoral areas that influence forests have to be considered in the context of the three stages of forest development. Forestry is unusual in having three activity types (managed forests, open access lands and harvesting from the mature forest frontier). Any particular policy instrument can have simultaneous but contrasting effects on these different activities. For example, price incentives would induce an expansion in forest management, but they would also induce expanding harvests and a contraction of the remaining area in mature natural forest. The effect of these policies and processes is to alter one of the key functions which determine the land use decisions made between different types of forestry, or between forestry and other land uses. Forest policy instruments are most likely to alter the forest value function but some will affect forest management through their impact on the cost of enforcing and maintaining property rights. Forest trade policy instruments will also primarily affect the forest value function. Extra-sectoral policies will work primarily through their effect on the agricultural land value and the costs of market access.

4.2 Extra-sectoral Influences and Factors

The world's forests are subject to forest management policies and other, extra-sectoral influences. Some of the most marked impacts on forests come from influences outside the sector. These include external shocks outside of the control of national government, such as the East Asian financial crisis of 1997, internal shocks such as civil war and conflict, macroeconomic policies, changes or policy interventions in sectors which compete with forestry for land and other inputs. Agriculture is a key sector in this regard. Policies adopted in other countries through their effect on trade patterns can also spill over into impacts on forests and competing land use sectors in other countries. This chapter, surveys the range of extra-sectoral influences which can affect the relationship between forest management and trade³⁴.

5

4.2.1 External and Internal Economic Impacts

If trade with another country consumes a large share of domestic production, and of forest production in particular, then a decline in the economy of the importing country can have a measurable impact on the forests of the producing and exporting country. The impact of the 1997 East Asian crisis on exports from Indonesia is a good example (Hyde, 2003). The impact occurs in two stages.

The importing country's aggregate demand declines in the first stage. Prices must fall. Initially, producers in the exporting country may try to maintain their former production levels despite the lower prices, and the impacts on the forest will continue relatively unchanged.

Eventually, manufactured capital (e.g., logging equipment, plant and machinery in the processing industries), infrastructure, and managed forests all require major repairs or replacement. This signals the second stage. Major repair and replacement is a fixed cost of operation. There are no means to pay fixed costs until the export market recovers and prices regain their former level. Therefore, some forest

³⁴ This chapter draws heavily on a forthcoming volume on the economics of global forestry by William Hyde (Hyde 2003).

operations will continue with deteriorating, less efficient, equipment which is more damaging of the forest. Others will be discontinued. The net effect of the second step must be a long-run decline in both managed forests and harvests from the natural forest frontier.³⁵

Internal shocks which affect forest production and trade include: significant social and institutional change and adjustment (e.g. civil disorder or even civil war), comprehensive macroeconomic policy adjustment (e.g. structural adjustment), and the more specialized fiscal and monetary instruments of macroeconomic policy.

The impact of these internal shocks is generally to create uncertainty. In general, managers postpone investment in the presence of uncertainty. They draw down their forest stocks while covering their variable costs of operation—until the general social and institutional outlook becomes more settled. In the presence of extreme uncertainty, loggers and managers not only postpone investment but they also may become more aggressive in their harvesting of existing economic forest stocks. An example is given by the logging activities of the Cambodian army in the 1990s. The army redirected some of its men and equipment into logging operations and then sold the logs across the border in Thailand in order to obtain finances to support its military activity. It extended its logging into areas that had not been logged, areas that civilian loggers could not afford to log, increasing the country's annual harvest level several times over.

4.2.2 Macroeconomic Policies, Structural Adjustment and Poverty Reduction Strategies

Economic growth stimulates demand for agricultural, forestry and mining products. This may boost internal markets as well as trade, because of increased needs in machinery and investment. In the long run, this may lead to economic development and may be beneficial to SFM, but this is conditional on other variables, such as investment in the forest sector or land-use decisions.

The government may assign a strategic role to certain sectors within the overall development strategy by favoring one sector over another (Wunder 2000, van Soest 2000). Clearly, this choice depends to a great extent on wider socio-economic variables such as relative prices and exchange earnings in different sectors, on poverty or population growth, but it can clearly be sustained by governmental decisions.

Many studies have highlighted the importance of macroeconomic policies, in particular in association with structural adjustment programmes (SAPs), in influencing both forest management and trade (Barbier et al 1994). These have focused on the impacts of either a package of macroeconomic and sectoral measures as in the SAPs or specific fiscal and monetary policy instruments. But the linkages with forest management are complex and studies have produced conflicting conclusions.

While structural adjustment programmes may initially create uncertainty, giving rise to the effects described in the preceding section, their longer term effects are more complex. Brazil's experience between 1970 and 1995 provides an example. Brazil suffered a 22-fold increase in international debt, a 40-fold increase in long-term interest rates, and annual inflation rates as high as 2 560 percent following the oil shock of 1974 and during twenty years of diverse domestic economic policies (Young 1996). The International Monetary Fund imposed a program of structural adjustments on Brazil as a condition for the Fund's assistance with Brazil's international debt.

Young (1996) traced the effects of this program on the Amazon's natural forest frontier, identifying four fundamental relationships between broad policy and deforestation:

- Reduction in subsidized agricultural credit as a result of the need to reduce government expenditure discouraged conversion of forest land at the natural forest frontier to agriculture

³⁵ Sudden sharp increases in exogenous demand are less common than sharp decreases. They create a similar two-stage adjustment process. Producers in the exporting country increase production by adding variable capital and labour to the existing fixed capital and fixed area of mature forest. During the first stage, operations would be neither as economically efficient nor as environmental sound as they had been, but production would increase. Eventually economic efficiency and better environmental performance would return, as the new fixed capital becomes available and the newly managed forests attain maturity,

- Reduction in expenditures for roadbuilding discouraged deforestation and improved the conditions of the forest at the natural frontier.
- Export incentives designed to improve Brazil's balance of payments led to appreciating prices for more capital-intensive commercial agricultural products like soybeans. This increased land values for those small farms that could be converted for use by the larger commercial agricultural operations. These small farmers then migrated to the forest frontier and cleared forest for new farming activities.
- The shift to capital intensive production reduced the demand for agricultural labour causing unemployment and a decrease in the real agricultural wage. The latter effect was reinforced by other programs of the central government designed to decrease the minimum wage. As a result, agricultural workers also migrated to the frontier where they converted Amazonian forest for their new smallholding agricultural activities.³⁶

The notable conclusion is the contrast in effects. Brazil's structural adjustment program had multiple and mixed effects on the forest frontier resulting in an indeterminate net long-run effect on deforestation.

Contreras-Hermosilla (2000) notes that 'SAP's may unintentionally encourage forest decline for three reasons : first, they may induce unemployment and greater poverty leading to migration to forest areas... Second, SAPs often stimulate agricultural exports at the expense of forested land...Third, SAPs may 'stimulate forest exports based on unsustainable methods'. Kaimowitz goes even further by claiming that SAPs 'tend to boost production of tradable goods without successfully promoting more difficult institutional reforms that could counterbalance the increased pressure on forests'.

Indeed, it seems that the influence of SAPs do particularly concern the forest sector: 'the expansionary impacts of currency devaluations, tariff liberalization and reduction of real interest rates may be most directly and adversely felt in the natural resource use' (World Bank quoted by Contreras-Hermosilla, 2000).

Overall, SAPs target trends and factors which hinder SFM. SAPs should have positive long term effects, but do not always have. It should be noted, however, that one possible reason for insufficient performances of SAPs is their often partial application (World Bank).

SAPs have given way to poverty reduction strategy papers (PRSPs). Initially required by the IMF and World Bank as a basis for access to debt relief in Highly Indebted Poor Countries (HIPC), PRSPs have been required by all countries supported by the International Development Agency since July 2002. Interim PRSPs (I-PRSPs) are road maps to full PRSPs. As of April 2003, there were 26 full PRSPs and 45 I-PRSPs. Bilateral donors are also increasingly subscribing to PRSPs and they have thus emerged as a central determinant of the development agenda in many countries. Whilst largely taking the place of structural adjustment programmes (SAPs) in these countries, PRSPs continue to require the 'traditional' macroeconomic prescriptions of the IMF – privatisations, capital market liberalisation, import liberalisation, fiscal restraint and state down-sizing. Some PRSPs introduce the proviso that economic growth should be "quality growth", but they typically do not discuss why the proposed actions are likely to work better for poverty reduction than comparable actions have done in the past, and what are the critical things that need to happen (Booth & Lucas 2002).

PRSPs are critical as frameworks for fostering trade based on sustainable forest management and local livelihoods. Yet PRSPs to date merely demonstrate that there is a long way to go to develop bottom-up, continuously improving processes rather than one-off encyclopaedias of externally-driven ideas. The recognition of forests as a development asset has so far been disappointing in many PRSPs. A recent study looked at the 11 PRSPs and 25 I-PRSPs in Sub-Saharan Africa and noted that whilst 84 percent of them touched on forestry issues, almost none of them were convincing about forests-poverty links and their future potential; only Malawi and Mozambique made a significant mention (Oksanen & Mersmann 2002). Of course these papers in themselves tell us little about implementation.

³⁶ Others (Mahar 1988, Mahar and Schneider 1994, and Schneider 1994) draw similar conclusions.

4.2.3 Fiscal and Monetary Policies

Fiscal policy refers to the use of adjustments in government expenditure or taxation to influence the overall level of activity in the economy. It is commonly used as a short-term first step out of a period of economic stagnation or decline. Because of its association with high levels of government borrowing, the use of fiscal policy runs counter to the prescriptions of most SAPs which tend to advocate reductions in public expenditure.

Government expenditures provide the new demand to employ previously unemployed resources. They have their largest beneficial effects when the sectors receiving the influx of government funds are sectors that both respond and grow rapidly themselves and also link with numerous other sectors of the economy through their demands for the products of those other sectors or their supply of inputs to them. These links mean that growth in the first sector is a source of growth in the linked sectors.

The construction industry is often a prime candidate for intervention of this kind. Construction responds rapidly to new demand for its product, either domestic housing or an input to production in other industrial sectors. Its use of wood as one of its own inputs makes the demand of the construction industry of prime importance for forestry and the wood products industries. Injection of government expenditure into construction therefore leads to an increase in activity at all margins of forest operation, managed forests, as well as harvesting from open access degraded forests and mature forest at the natural forest frontier.

The effects on forests of injections of government expenditures into other sectors depend on the links between those sectors and the forestry sector. For many injections the links will be small and the effects on forestry will also be small, and delayed as well.

An alternative fiscal tool for encouraging a stagnant economy is to reduce taxes. The expectation is that tax decreases allow consumers greater income to use on consumption and the additional consumption will fuel economic expansion. Of course, only the smallest share of additional consumption will be on forest products and the effect on forestry will probably be minimal. The longer-term effects of fiscal policy (either expenditure or taxation) depend on the effectiveness of that policy in generating economic growth and the effect of general macroeconomic economic growth on forestry.

The main instrument of monetary policy is the interest rate. Monetary policy is effected by central banks adjusting the interest rate, raising it to dampen growth and control inflation in times of full employment and decreasing it in times of economic stagnation in an effort to encourage renewed investment and reinvigorate an economy with underemployed resources. This has two types of effect on the forest products sector. If the policy is successful, lower interest rates increase the demand for construction by all other sectors of the economy. The increase in construction increases that sector's demand for wood products, and timber harvest levels increase at all land use margins. But changes in the interest rate through their effect on the opportunity cost of capital have a more direct effect on harvesting rates and rotations for managed forests.

The *Faustmann* model predicts that lower interest rates cause forest managers to decrease harvest rates as they lengthen timber rotations and increase their forest stocks. This is a partial prediction, however, because the *Faustmann* model provides no indication of the impacts of interest rates on other types of forest activity in open access or forest frontier areas. During the 1994-1995 implementation of the Brazilian Plano Real, for example, which stabilised interest rates, there was a marked increase in deforestation (Macqueen, 2003).

Where the value of a country's currency relative to other national currencies is controlled by the central bank or the central government, then the exchange rate can be a second component of monetary policy.³⁷ A move from fixed to market-led exchange rates has been a common feature of SAPs and other economic liberalisation programmes. As exchange rates affect the relative competitiveness of exports and imports they have a significant impact on trade patterns, often greater than that of trade policy. The devaluation in

³⁷ Since the 1970s most countries allow the market to determine the values of their currencies.

Mexico in 1994 is considered to have had more impact on forest product exports to the US than the provisions of NAFTA (Lyke 1998).

4.2.4 Policies on Agriculture, Energy, Mining, Demography and Health

As policy changes induce expansion or contraction in the sectors that compete with forestry for inputs, these policies also affect forestry and forest trade. The important competition in inputs is for land, most generally between agriculture and forestry. Much forest conversion has been stimulated by policies to promote agriculture through giving land title and/or compensation to people clearing land for agricultural use. But the impact of agricultural policy is complex as it depends on the stage of forest development and because not all agricultural improvements use more land.

Agricultural policies affect agricultural land use, including those new agricultural lands that are converted from forests. For example, the US and Canada encouraged agricultural settlement on their frontiers in the 19th Century, Brazil offered land and incentives to colonists of the Amazon in from settlement programmes dating back to the 1960s, Indonesia financed the movement of new settlers to the forest frontier in a policy called “transmigration” in the 1980s, and Finland compensated farmers for clearing new land for agricultural use in the early 1990s. In each case, agricultural (or population) policy increased the value of land in agriculture, and encouraged agricultural expansion within a region in the first stage of forest development.

In the second and third stages of forest development, agricultural policies no longer have an effect on the forest frontier. By this time, the more common agricultural policies are subsidies for agricultural inputs such as fertilisers and price supports for agricultural outputs. Input subsidies tend to favour capital inputs relative to land inputs and can thus lead to a more intensive use of land. Depending on the magnitude of the subsidy, these programmes can either expand or contract agriculture’s use of the degraded open access lands in the second stage of forest development and they can either increase or decrease agriculture’s competitive position at the intensive margin of forest management in the third stage.

The effects of agricultural input subsidies are compounded by the effects of government agricultural research programmes. They represent substantial government investments, and some have produced phenomenal increases in agricultural productivity and decreases in agricultural costs. They tend to make capital inputs less expensive and more productive and so are relatively capital-using and land-saving.

The effects of price supports for agricultural outputs on forests is much clearer than in the case of input subsidies and research. Agricultural price supports increase the value of land in agriculture at all distances from the market. As a result for regions in the second stage of forest development, agriculture expands into some of the degraded open access lands which previously were too far from the market to be viable for agriculture. For regions in the third stage of forest development they improve agriculture’s ability to compete with the intensive margin of managed forestry, thereby converting some land away from forest management.³⁸

There are dynamic effects which complicate the relationship between agricultural policy and deforestation. Some dynamic and general equilibrium models of adjustment programmes show that policies which raise prices received by farmers in the short run may reduce urban demand for foodstuffs, making the ultimate impact on deforestation inconclusive (Kaimowitz and Angelsen 1998). Pro-export policies designed to increase agricultural exports are likely to have stronger deforestation effects than policies that promote production for the domestic market. This is because an increased supply of agricultural exports is less likely to put downward pressure on prices, and dampen the initial effects of the policies. Similarly pro-agricultural policies are likely to have stronger deforestation effects in the contexts of globalised agricultural markets and trade liberalisation.

³⁸ A few developing country governments have imported agricultural products and held food prices artificially low in an effort to support urban populations and encourage industrialization. These food price controls probably shift some farmers out of commercial agriculture and back into more rudimentary subsistence agricultural activities.

The agricultural programmes of the North American and Western European countries may be the best example of long-term programmes that spillover to affect the forests of other countries. But the effects are complex and whether the outcome is positive for forest management depends on the particular circumstances. The US and Canada spend roughly US\$ 45 billion annually on agricultural programs and the European Union spends an even larger amount. These immense public agricultural expenditures fund the excessive use of all inputs, including large shares of North American and European land that would otherwise be under tree cover rather than in agricultural use.

But there is also an effect on trade patterns and hence on forests in other countries. The use of additional inputs produces large agricultural surpluses, some of which are exported to developing countries where their artificially low prices drive out competition from local agriculture production. Corn production in Mexico, which has been adversely affected by subsidised imports from the US, provides an example (Oxfam 2003). Alternatively, these subsidised exports may compete with developing country exports as in the case of EU and US subsidies to cotton, which through their effect on the world price, are damaging the prospects for West African cotton growers and exporters. As a result, the value of land in agriculture is lower and the level of agricultural production lower than in the absence of the subsidies.

What this means for forests depends on the type of agricultural systems that are affected. On the one hand it should produce a contraction in the area under agriculture, reducing agriculture's use of open access degraded land for regions in the second stage of forest development and making it less competitive with managed forests for regions in the third stage of forest development. But the contraction in agriculture means contraction in employment also. Some unemployed local farmers and agricultural workers may return to subsistence farming which uses land more extensively than commercial agriculture. Therefore, one effect of the North American and EU agricultural policies is to convert frontier forest in developing countries out of forest and into subsistence agricultural use (The Economist, 2002).

It is conceivable therefore that the North American and EU agricultural support programs are more destructive of global forests than all commercial forest activities at the frontiers of developing countries. However, this effect has not been examined quantitatively. Revisions of agricultural policy may have greater forest conserving effects than direct environmental policies such as forest certification, improved silvicultural standards, or increased enforcement against illegal logging. Furthermore, they would be easier to administer because they simply require reducing or discontinuing existing subsidies. They do not impose the monitoring difficulties inherent in forest certification, silvicultural standards, or effective controls on illegal logging.³⁹

The mining sector can have great or small direct impact on forest decline according to the area and the mining technology applied, but it always plays an important indirect role (see Kaimowitz 1998). This is also true for its influence on forest product trade, as it impacts on infrastructure and employment opportunities.

An oil or mining boom creates rent opportunities which may or may not be used for SFM. Imports will increase, and depending on the nature of imports, the impacts on SFM will be different. If more food products are imported, the domestic food crop market will shrink and marginal farmers are likely to move to urban areas, which decreases pressure on forest land. On the other hand, if more other consumption goods are imported, the impact on the agricultural and forest sectors are less clear.

Wunder (2000) for example analyses the influence of the mining sector through oil cycles and macroeconomic changes. He notes that the expansion of oil exports has led to a marked decrease in timber export: Wunder (2000): 'In 1960, timber made up almost three fourths of Gabon's exports, but with the expansion of oil exports, this share was reduced to less than 10% by 1980 (Pourtier 1989: 191)'. This has had important impacts on land use change in forest areas: 'The single most important transformation of Gabonese society during the last half-century has been the accelerated urbanization of a forest people (Walter 2000).

In Gabon, 'oil wealth was generally allocated with a strong urban bias, favouring prestige projects in urban construction, infrastructure in parastatal companies and in urban social sectors. The indirect impact (of most public projects) was to massively pull labour out of rural areas towards remunerative employment options in the cities, as civil servants, in parastatal companies, in services or in construction.'

³⁹ Of course, the greater difficulty lies in the transactions costs involved in changing the agricultural support policies and institutions in North America and Western Europe.

(Wunder 2000). Again, according to Wunder, 'this urban development bias, and the correspondent neglect of agriculture, is likely to have reduced pressures on forests.' The inverse conclusion can be drawn for countries which can not or not anymore built on steady oil revenues. Van Soest takes the example of Cameroon, where the decrease in oil revenue and the following economic crisis has lead to unemployment in urban areas and to a population shift back to rural and forested areas.

Overall, if governance is optimal, rents may be invested in order to induce SFM and induce long term development. If governance is weak, rents may be directed to consumption, which may have negative effects on SFM, depending on the direct threats to the forest surface through population growth and agricultural development. According to Gregory and Ingram (2000) 'the growth in human population over the past century has been closely associated with increased production of food and forest products (Dyson 1996)...Overall a population of about 6 billion is projected to raise to about 8 billion by about 2025 with most of the increase in the less developed countries in Africa and Asia' (Fischer Heiling 1997).

Numerous authors have studied the influence of population growth on deforestation, and many of them find a negative relationship, for instance Allen and Barnes (1985), Burgess (1992), Deacon (1994), Southgate (1994) or Ekbohm and Boj  (1999). Specific country studies have also been conducted by Kummer and Sham (1994) for the Philippines, Panayotou and Sungsuwan (1994) for Thailand, Reis and Guzman (1994) for Brazil and Southgate, Sierra and Brown (1991) for Ecuador, van Soest for Cameroon (1998), among others. Various authors note, however, that the way forests are used depend on several other variables, mostly socio-economic variables , such as per capita revenue, unemployment, agricultural productivity, or access to infrastructure (Van Soest 1998 , Contreras-Hermosilla 2000).

Clearly, population growth is one factor which has an important direct impact on the forest sector and forest product management through both, higher pressure on land and increasing demand for agricultural and forest products (construction timber, fuelwood). As for the influence of population growth on trade, it seems that it might have an important influence on supply and demand for forest products, both concerning the amount of products asked for and the type of products. Combined with urbanization, population growth might lead to the creation of huge market chains in small spatial areas which could render trade more competitive and efficient.

Population growth leads to growing demand. But this does not always lead to unsustainable forest exploitation, depending on the import structure and the plantation policy. First, Wunder (2000) argues 'that demand structure in Gabon indeed changed dramatically, but that this had unimportant impacts on land use because food imports grew spectacularly.' Also, trees outside forests, will increasingly be used to meet the demand of the local population (FOSA 2001): 'This is particularly the case of home gardens in the humid zone countries like Rwanda, Burundi, Uganda and several of West African countries'. However, one of the conditions for wider spread plantations of trees outside forests are secure land tenure.

Finally, demand for wildlife is one of the main driving forces of ecotourism, the major forest product service of tropical forest countries. However, the efficiency of the management of protected areas seems still insufficient. According to FOSA, 'problems like encroachment, logging, collection of fuelwood and other products' are not rare despite an increasing number of community-based management schemes. Political instability and unsolved land-tenure rights might be impeding factors. What is more, investment in the sector seems to be very low. According to FOA, 'a study by the WCMC shows that Africa's investment in park management is the lowest in the world'.

4.2.5 Impacts of Regional Development Programmes

Regional development programmes generally target poorer rural regions such as Appalachia in the US, or western China as part of the new Western Development Program (and the associated Natural Forest Protection Program), or entirely undeveloped regions such as those that gained new settlers from Indonesia's transmigration program in the 1990s. These regions tend to be sources of natural forest. Managed forests, where they exist, tend to be in better developed regions closer to the major markets—in the coastal plains and the Piedmont of the US South and Southeast, for example. Therefore, regional development programmes tend to encourage exploitation of the forest frontier, shifting it further into the hinterlands and up the mountainsides. Moreover, to the extent that the forest products from regions

benefiting from public development programs substitute for production from other regions, these regional development programs also delay the progress of sustainable forest activities in more developed regions.

Governments may also use tax policies to encourage investment in less-developed regions of the country. If these policies are effective, then employment opportunities may improve and workers may be drawn toward better labour opportunities and away from forested rural areas. The condition of the natural forest at the frontier may even improve as a result. However, the relative position of the lowest wage workers may decline as a result of these policies.⁴⁰ Employment in low wage subsistence agriculture may increase and the reliance of the rural poor on the forest also may increase.

In addition to tax policies, governments often invest directly in infrastructure, including public utilities and public services like education, hospitals, and communication networks. Antle (1983) showed that the full collection of items identified with infrastructure has a significant and positive effect on rural economic development in general. Improved roads and technologies in particular have important effects on the general condition of natural forests. They have a smaller effect on managed forests because the latter occur in regions that are already developed.

In the earliest stage of forest development, new roads and technologies improve the conditions for local development. They increase the value of land in agriculture and in forest relative to distance from the market. This means that it becomes worthwhile to convert some degraded forest into permanent agricultural land. But it also results in degradation and deforestation of additional lands which previously were too far removed to be worth using for extraction of timber.

In the second and third stages of development, improved access and technology makes the region's land more valuable in all uses. This extends the claims of permanent agriculture and shifts the entire degraded open access area further into the geographic interior in stage II. In stage III, it extends agriculture into the area of previously managed forest and extends managed forestry into the area of previously degraded forest. The natural forest frontier shifts further into the interior as the deforested area expands in both the second and third stages of forest development.

Thailand provides a recent example of how road development is linked with deforestation. Thailand built roads into its more sparsely inhabited Northeast in the 1960s, the main objective being to increase security—military access and encouragement for human settlement to secure the region against encroachment from Laos and Cambodia during the Vietnam War. The main effect was an increase in timber harvests. The links between roads and timber harvests is strengthened by the fact that rights to adjacent lands and timber are often part of a government's payment to private road building contractors. This was common in the US in the 19th century but there are more recent examples. The government of Laos recently made a similar transfer of timber rights for building a highway through its northern forests to provide access to the rapidly developing markets of southern China. This can will further promote the use of imported timber by China in order to reinforce its logging ban.

Roads can also have an indirect effect on the forest through their impact on overall regional development. Some labour will be attracted to employment opportunities out of the region. As the local labour supply declines, local wages must increase. This reduces the returns from forestry activities as labour is a significant component of costs. The boundary of extraction from the remaining natural forest there shifts inward and the areas of degraded forest and deforestation decline.

4.2.6 Impact of General Economic Growth

At any stage of forest development, there are two fundamental means for minimizing the degraded area, reducing the cost of property rights and attracting some human activity away from the forest. This requires finding the best bundle of property rights and the institution that can provide this bundle at least cost.

Agricultural or forest users with lower opportunity costs can afford the time to travel further into the natural forest to extract its products. Because their costs are low, they can also justify removing material

⁴⁰ See Boyd and Hyde (1989) on the effects of the US minimum wage on loggers and workers in the forest products industries.

in the degraded area down to a low level. Providing these low wage or low opportunity cost agriculture or forest users with improved employment opportunities outside the forest will cause some of them to change from extractive activities in the forest to the higher wage employment.

The combined effects of improved property rights and attracting labour away from the forest results in a contraction of the degraded open access and an increase in the forest density in the remaining open access area. Turning the argument around: poverty is linked to forest degradation and depletion; economic development induces improvements in the forest environment as it shifts land into sustainable activities. One of the more thorough bodies of evidence of these short term effects has been a study on the impacts of oil wealth on the fate of the forest, drawing on case studies from Cameroon, Ecuador, Gabon, Indonesia, Mexico, Nigeria, Papua New Guinea and Venezuela (Wunder, 2003).

India's most productive agricultural region, the Punjab, provides another specific example. The region began a period of rapid and sustained development in 1960. Crop yields per hectare tripled by 1990 and income per capita doubled (in constant dollars). The land area in agricultural crops more than doubled while the principal agricultural prices remained relatively constant or declined—depending on the crop. Meanwhile, the rural share of the region's population remained steady at approximately 22 percent. Forest cover in the Punjab increased six-fold and horticultural tree cover increased more than 250 percent. A large area had been cleared of its forest cover and existed only as an open access wasteland before 1960. The open access lands have declined and the forest stock has increased. A large share of the open access lands has been converted into cropland since then, while an additional large share has been reforested (Singh, 1994).

The longer term effects of economic development on the forest is unclear. Improved wages and better labour opportunities may lead to institutions with improved ability to insure property rights and manage economic transitions and provide for economic stability. Conversely there are plenty of examples in which an abundance of riches (whether based on forest wealth or not) during economic development have led to spiralling inequity, corruption and capital flight (Stevens, 2003). Such trends lead ultimately to a resurgence in poverty and land degradation.

In sum, rural economic development is central to any program of improved forest sustainability and any attempt to decrease the rate of global deforestation. Accomplishing it is not an easy task, but it is certainly no more difficult than trying to accomplish sustainable forestry and slowing deforestation through the imposition of government regulations on the use of relatively low-valued and dispersed resources by a scattered and poor rural population.

4.2.7 Conclusions

Assessing the impact of sectoral and extra-sectoral factors on trade and sustainable forest management is challenging for several reasons: first, all the 'underlying causes' of forest decline are characterized by a high degree of interrelationship. Indeed, according to Contreras-Hermosilla (2000) various explicative factors may form 'a complex socio-economic, cultural and political event' which implies that 'a single force, such as agricultural intensification, may operate in diametrically opposite ways.' (Contreras-Hermosilla 2000).

Second, as with other definitions on sustainability, the main challenge with the concept of SFM is its application and the treatment of conflicting objectives. Sustainable forest management 'refers to meeting present needs for forest goods and services, while ensuring their continued availability in the long term.' (FAO SOFO 2003).

Extra sectoral influences with a positive impact on SFM include land tenure security, the achieved demographic transition, a low HIV/AIDS prevalence ratio, institutional stability and good governance.

Extra-sectoral influences with a negative impact (in addition to the opposite of extra-sectoral factors above) include agricultural intensification through mechanization in agricultural frontiers (forest margins), directed settlements in forest areas, improved access to credits for beef cattle, mechanized agriculture, and large-scale forest and tree crop plantations in areas with substantial natural forests and energy and mining projects in forested areas.

The main ways of increasing the quantity of managed forest are: to increase the value of forests compared to other land uses and to reduce the cost of property rights. Unfortunately, attempts to increase the value of forests in order to promote forest management may also lead to increasing degradation of open access areas and the natural forests at the forest frontier. The two main ways of reducing forest degradation in natural forests are: to attract people out of the forests and to reduce the cost of property rights. The common ground lies with the reduction of costs and risks associated with property rights. Linking trade liberalisation to improved and impartial property rights and the institutions responsible for them (either nationally or through well designed decentralisation and community management programmes) would be one way forward. Even then, enforcement will never be perfect and some illegal logging will occur because the costs of illegal harvesting at the frontier (even with enforcement factored in) are much less than the costs of growing and harvesting managed stands. That is, the incentives for illegal harvests are great.

Attracting people out of natural forests through general development is another promising option. Unfortunately the most promising initiatives (such as effective urban and industrial development programmes or the massive effect predicted for a reduction in agricultural subsidies for example in Europe and America) may be beyond the scope of forest agencies to influence. Incentive programmes, especially for local input subsidies or technology developments in agriculture (leading to land intensification), or tax reductions for capital gains tax (leading to investment in managed forest) are perhaps more realistic at that level of operation. Making the case for more effective extra-sectoral change will be an important priority for the future.

4.3 Policy Instruments and Processes Affecting Trade in Forest Products and Services

4.3.1 Introducing the Range of Policy Instruments and Processes

This chapter gives an overview of the various types of policy and process employed in the forest sector at local, national and international level to influence forest management and considers their implications for trade patterns. The focus is on policies that aim primarily to affect forest resource management and the conditions under which timber is harvested and forest products processed. Through their impact on raw material availability and the competitiveness of the forest products industry in different locations, these have implications for trade. Forest sector trade policies that are primarily designed to restrict trade or change trade patterns are reviewed in the next chapter.

Policies can be classified in several ways. In this section we group policies according to the stakeholder group most closely associated with their implementation. Most policy measures are primarily associated with national governments – in sections 5.2 we deal with these national public policies.

Inter-governmental processes are also of relevance because of the global interest in the social and environmental services provided by forests, notably the UN Intergovernmental Panel on Forests, which was replaced in 1998 by the Intergovernmental Forum on Forests and then in 2000 by the UN Forum on Forests.

In addition, given the perceived failings or inadequacies of government policy, a range of policy initiatives of other stakeholders such as the private sector and NGOs are of increasing impact – these are outlined in section 5.4 and 5.5. These efforts are of particular note on the ‘demand side’ where several are focused on trying to improve the sustainability of consumption of forest products. Several voluntary ‘supply side’, production-oriented initiatives are also of note.

4.3.2 Domestic Forest Policies and Processes

Some countries have very strong, implemented national forest programmes (in various shapes and forms) – with a range of effects on trade – others exist on paper only, or not at all. Where they have some coherence and clout (as opposed to being the sum of often diverse and sometimes incoherent policies, laws and other official pronouncements), national forest strategies or programmes set a framework for

forest governance, forest management and the future of the forest sector. This in effect aims to alter the market-induced pattern of forest development described in Section 4.1 to one which meets broader social and environmental objectives.

Where national forest programmes have some strength, one of their major effects on trade is through the designation of forests as production forests, for conversion to other land uses, or for protection only as this affects the balance between raw materials, production capacity and local demand. Such designation can, in turn, affect forest management in other countries, for example in the case of logging bans – see below. The effectiveness of these strategies in altering the pattern of forest development will depend on how much governments are willing to absorb the costs of protection and to uphold property rights in production forest areas. Evidence of their lack of willingness or financial capacity to do so in many countries is given by the forest parklands around the world, which suffer encroachment, and the timber reserves around the world, which experience illegal logging and illegal export trade.

This reflects process shortcomings also. In most cases national forest strategies have been internationally driven and heavily dependent on donor funding. The imperative to develop, implement, monitor and evaluate such national forestry programmes was spelled out in the proposals of the Intergovernmental Panel on Forests (IPF) and its successor the Intergovernmental Forum on Forests (IFF). If NFPs are to succeed they need to avoid the mistakes of previous internationally driven calls for forest sector plans. Many countries developed National Forestry Action Plans (NFAPs) from the mid 1980s onwards – following a model that emerged from the global Tropical Forestry Action Plan of that time. But many NFAPs remained exercises on paper only lasting only as long as donors propped them up - they failed to catalyse the detailed actions expected of them. In general, this was because they were done quickly, often by foreign experts, and failed to engage with political and economic reality to show not only *what* needs to change, but also *how* it can change, and how such change can be sustained. Many one-off institutional reform approaches stimulated by such plans have left legacies of huge and unsustainable recurrent transaction costs.

Forest Policies for an Enabling Environment

Over the last fifteen years, a number of Asian and Pacific countries - China, New Zealand, Philippines, Sri Lanka, Thailand and Vietnam – have completely or partially banned logging in natural forests. The aim has been to conserve natural forests and obtain a larger portion of wood supply from tree plantations and agroforestry. Results have been mixed (Brown *et al* 2002). On the positive side, New Zealand managed to replace the natural forest supplies with those from thriving forest plantations which now produce large volumes of timber for export. In Sri Lanka, by 1993 home gardens and coconut and rubber plantations were supplying 70% of all industrial roundwood. However, these bans can be difficult and costly to enforce and by raising the price of timber locally, provide incentives for illegal logging and trade. This is a problem in Sri Lanka where perhaps as much as one quarter of all wood delivered to its mill are the result of illegal logging (Hyde 2003).

Another drawback is that uncertainty about future harvest restrictions will induce producers to act to protect their investments. This often involves pre-emptive harvesting, before the policy can become official. The effect will be to reduce domestic timber prices and increase exports based on non-sustainable production. India restricted all harvests of its high-valued but declining sandalwood in an effort to preserve the remaining resource but some landowners responded by harvesting immediately before the restriction became effective. Harvesting has also continued on an illegal basis since the restriction came into force with the result that the standing sandalwood inventory has declined (Hyde, forthcoming).

Such bans to be effective require commitment of government resources. China banned logging in 42 million hectares of forest in 1998 and employed special police to enforce the policy. Government compensation programmes provided assistance to large numbers of workers that lost their jobs in the process. Officials expected timber harvests from natural forest to decline from 32 million cubic meters in 1997 to 12 million cubic meters in 2003. They also expected that in the medium-run some 34 million hectares of tree plantations will make up most of the difference. It is still too soon to know whether they will succeed.

In some countries, the transition to alternative domestic sources of timber has not been smooth, reflecting the fact that comparative advantage in harvesting natural forests does not always translate into comparative advantage in domestic plantations. Thus the Philippines and Thailand which imposed logging

bans after commercial timber resources had been largely depleted are now significant importers of timber (Durst *et al.* eds. 2001). Thailand was more successful than the Philippines at curbing illegal logging. Yet, forest clearing for agriculture continues in both countries and logging bans cannot solve that problem. Plantations still provide only a small portion of the two countries' wood supply.

Where logging bans have been effectively enforced they have had significant implications for trade flows. China, the Philippines, Thailand, and Vietnam all greatly increased their forest product imports after they restricted logging. Some consider such harvesting controls to be formal trade barriers and as such to come under the WTO remit but others disagree, considering that they are not trade-related (Bourke 2002). There has been perhaps more concern over the implications for forest management in neighbouring countries. Restricting logging in one country may simply displace the problem to other countries. The bans in the countries mentioned above fuelled illegal logging and destructive timber harvesting in neighbouring countries such as Cambodia, Indonesia, Laos, Myanmar, and Russia.

Forest Resource Tenure

Property rights over the forest resource have a major determining influence on the resource base available for international trade and on the extent to which different groups benefit from such trade. Globally, governments claim to own and administer 77% of all forests. This includes large areas of forest that local communities manage without official recognition. Communities and indigenous people formally own 7% of the forests and officially administer an additional 4% that governments have reserved for them. Individual landowners and private companies own the remaining 12% (White and Martin 2002).

In many countries worldwide, national governments are increasingly seeking to reduce their own direct involvement in forest management. Motivations for this vary from one country to another. Some are common – a drive for greater efficiency and profitability, reduced pressure on the public purse particularly as governments are finding that formal rights to forests are not easily enforced. Others are unique to specific circumstances – such as empowering previously disadvantaged groups. .

One route is to give official recognition to community management. In tropical forest areas, indigenous and other communities now own or administer about 25% of the forests and at current rates this could double in 15 years (White and Martin 2002). Terms such as “community forestry”, “joint forest management”, “public participation”, and “devolution”; all refer to transfers to local users of some or all of the rights to forests that were previously the unambiguous responsibility of central forest ministries.

Where effective, the shift to local management reduces the cost of maintaining property rights as local users of the land and forest resources know the resources and the demands on them better than the officials of the forest ministry. This means that more forest land will be managed sustainably and the area of degraded open access forest will decline. Local management can improve long-term land management for agriculture, timber and other extractive products of the forest, and also for local non-market values like some erosion control and some recreational forest use. The list of successful examples of community management is almost endless and it comes from all corners of the world (Ostrom ?).

However, local property rights and local management do have their limits. Transfers of rights to local communities are less successful in halting forest degradation where the local values for forest products are very low relative to the community values for other land uses or for their time. This is the general case in the first stage of forest development where forest resources are plentiful but also applies to open access forests in the second and third stages of forest development. They are also less effective where important local groups have competing demands on the forest (Dangi and Hyde, 2000); and where local property rights are incomplete or the policy environment is uncertain (Yin and Newman, 1998); or where values at stake are shared by the broader regional, national, or global community (e.g. Carbon sequestration, biodiversity, and some classes of tourism).

Another route being pursued is privatisation - tenure and use rights over state forest assets being transferred into private hands, and/or the outsourcing of forestry functions. Such transfers into private hands are likely to increase international trade in forest products and foreign direct investment in the forest products sector. Whether this will be good or bad for sustainable forest management is debatable and depends heavily on the way that the privatisation process is carried out. Perceptions abound that private companies are not accountable to public demands and have no incentive to provide environmental and

social goods and services. The extent to which trade affects pushes privatisation in a positive or negative direction in these terms depends on its effect on key challenges in forest privatisation such as:

- Developing clarity on the transaction costs and risks
- Designing tender systems for negotiated and optimised objectives
- Supporting preparedness in private sector and community organisations for negotiating and implementing ownership and management changes
- Managing post-transfer government responsibilities
- Dealing with the social impacts of change (Garforth *et al.* 2002).

Forest Decentralisation

Another route for national governments to reduce their direct forest management involvement is through decentralisation. At least 60 countries have recently decentralised some aspects of how they manage their natural resources, with mixed results. Examples can be found of reforms which have permitted disadvantaged groups to have more input into decisions about forests, engage in trade, provide more revenue to local governments, and improve the way people manage their forests. But examples can also be found of the opposite. Central governments tend to hand over burdensome tasks and low value resources, but keep the attractive activities and resources for themselves. Many local governments, on the other hand, do not really represent their local constituencies, and are inclined to over-exploit their natural resources. It has been argued that most failures are due to central governments not having decentralised enough – not making local governments truly democratic and not yet giving them real power over major decisions (Ribot 2002).

The locus and clarity of decision-making power over forest production following political-administrative decentralisation will affect the costs-benefit balance of the resource base for trade and the distribution of its benefits. The imperative of improving the local returns from trade is an explicit motivation for decentralised decision-making in some contexts.

Forest Resource Allocation Policies

Policies to allocate and charge for state-owned forest resources are believed to be a prime factor in determining international competitiveness of forest product companies, at least in the short term. Concessions that are administratively allocated instead of through an auctioning process and low royalties reduce costs for forest companies increasing their potential for international competitiveness. The long-standing dispute between the US and Canada over trade in softwood lumber stemmed from the view that companies in Canada were not being charged sufficiently for access to forest concessions (Bourke 2003).

For developing countries, there has been widespread concern that governments have not been capturing sufficient rents from their forest concessions, particularly for tropical timber. Yet there has not been retaliatory action on the same scale as the US Canada dispute, that is, imposition of countervailing duties, because these countries are not generally competing with sources of timber from developed countries.

The use of royalties and indirect charges such as reforestation levies has increased as well as their levels. NGOs and policy advisors have generally favoured increasing the charges made for the forest resource under the assumption that this would create incentives to use it more efficiently. More efficient use of the resource would mean that fewer logs would be needed to produce a given amount of product, thus reducing pressure on natural forests. Recently, however, this has been questioned. For example, in Indonesia Barr points out that making large diameter logs of commercial species more expensive encourages loggers and processors to adopt technologies that allow processors to use smaller diameter logs and non-conventional species. That can threaten large areas of forests that timber companies had previously considered of marginal value (Barr 2000a). He uses the recent adoption of small-spindle rotaries by Indonesian plywood producers as a case in point.

There is also the view that increasing royalties at the same time increases the incentives for illegal logging. Ultimately, the success of any revenue system depends on government's ability to enforce it (Hyde *et al* 1991).

Regulations on Forest Management

Various types of regulatory control over forest management affect costs of harvesting for example through the stipulations on the rate at which forest resources can be exploited, the techniques that must be employed and the procedures that must be followed, e.g. formulation of forest management plans. Restricting harvesting of certain types of forest, e.g. riparian forests and placing limits on forest conversion can have a significant effect on costs. Thus in Brazil, landowners in the Amazon are not permitted to clear more than 20% of their holdings and must maintain forest cover on the remaining 80% (Viana *et al.* 2002). Other regulations on harvesting practices such as diameter limits on felled trees, stipulations on distance between felled trees and zero disturbance within the habitat of an endangered species also affect production costs and competitiveness. This is particularly the case where such regulations are unevenly enforced or vary in stringency between countries. Products produced illegally, i.e. violating forest management regulations, thus have a competitive advantage, with implications for trade patterns. In some instance regulations may be traded off against other public goods (such as the installation and maintenance of rural infrastructure (Macqueen, 2001). In other cases they prove impossible to enforce, resulting in unchecked social and environmental damage as witnessed in Cambodia, Cameroon, Gabon, Guyana, Malaysia, Papua New Guinea among others (Forests Monitor 1998; Global Forest Watch 2000a, 2000b; Filer with Sekhran 1998; Madeley 1999; Global Witness 2001; Macqueen 2001).

A recent study from Indonesia provides evidence that the only way companies can profitably log the large and rapidly increasing area of forests that are in their second rotation is if they do it illegally and / or in a non-sustainable fashion. This also applies to many unlogged forests with low value timber. SFM for commercial timber production of such forests is often not economically attractive. That is one reason why illegal and non-sustainable logging practices are so widespread. Under these circumstances no changes in concession duration or forest regulations can convince companies to sustainably manage their forests. To do so they would have to operate at a loss (Barr 2000a).

Where regulations are enforced, they tend to add to the timber harvest costs, at least in the short term. This would lead to a decline in harvests at the forest frontier, and most would consider this an environmental improvement. The net effect may be substantial. For example, it was estimated that silvicultural prescriptions alone add an average of five to eighteen percent to the costs of forestry in the US South, British Columbia, and Finland - although the impacts on individual landowners vary with local conditions of land quality and enforcement (Sedjo 1999).

Of importance for the impact on trade is the fact that consumer demand is unaffected by these regulations. Therefore, the significant decreases in production that occur in the US South, British Columbia, and Finland, for example, will be largely compensated by increases in production from other parts of the US, inland Canada, and Russian Karelia, respectively, as well as with additional imports from developing countries. In each of these cases, the production shifts are largely from managed forests of regions in the third stage of forest development to the natural forest frontiers of regions in the second stage of forest development. Increased regulation of managed forests in one region can lead to increased exports from non-sustainable or illegal sources in another.

Forest Taxation

In some countries, income derived from capital gains is taxed at a lower rate than other income. Since most timber is held for long periods (appreciating over time) a lower tax rate for capital gains favours investments in managed forests in preference to activities like agriculture whose production periods are shorter. The UK's and Chile's tax codes which exclude inherited forests from death taxes induce similar shifts, thereby increasing the total land area in managed forests. The effect is not trivial. One estimate for the US suggests that the favourable treatment of capital gains provided twenty percent of the forest industry's after-tax profits in 1984 (Russakoff, 1985). Since additional managed production may substitute for some production from the natural forest frontier the favourable capital gains treatment may have a conserving effect on the natural forest. In terms of trade, the lower production costs will favour exports over imports.

In contrast, property taxes can accelerate the harvesting of timber and the degradation or conversion of forests. Standing timber and various other assets, as well as land, are often also subject to the property tax and their taxation introduces biases into resource allocation. The final accumulation of annual property taxes paid on the timber by the time of harvest is much greater than the accumulation of taxes would be if timber production were an annual agricultural activity and each period's growth were only taxed once. This time bias against forest management and encourages landowners to harvest their timber at an earlier age in order to avoid some of the repeated and accumulating taxation.⁴¹ This affects decision-making at the extensive margin between managed forestry and open access degraded forest and makes land there unprofitable for managed forestry. The combined effects of the time bias on managed forests and the conversion of the extensive margin into unprofitable forestland were a major reason that many firms in the southern US forest industry "cut and got out" in the 1920s and moved to the American West. The effect of the property tax on timber management in places like the South and the Lake States of the US caused policy makers to introduce yield taxes as an alternative. Yield taxes are assessed on timber value only once at the time of harvest.

Taxation systems through their effect on the returns to forestry affect competitiveness relative to producers in other countries and thus can potentially impact on trade patterns and incentives for inward investment. Their impact on trade patterns is not as evident as for other more direct types of financial incentive.

Policies on Forest Resource Development

Governments have typically used a number of means such as subsidies and tax concessions to develop forest resources. For example, the development of export plantation sectors in Chile and Brazil owe much to generous government incentive programmes (Hyde 2003; Viana *et al.* 2002). Between 1974 and 1994, the Chilean Government spent some US\$50 million on afforestation grants. Even so there are some who claim that these subsidies were unnecessary as plantations would have been profitable in Chile without this financial assistance (Cossalter and Pye Smith 2003).

Assistance takes many forms in forestry, but often involves reducing production costs through planting subsidies, free seedlings, and tax concessions, assisted transport, provision of extension services, the provision of infrastructure such as roads.

Financial incentives are more common in developed countries (e.g. some Canadian provinces, the UK, and the Nordic countries and the US (Boyd and Hyde 1989). Since incentives are usually linked to forest management, their impacts are largely restricted to regions in the third stage of forest development. Incentives decrease the private management costs and, therefore, increase forest land value. Land at both the intensive and extensive margins of forest activity shifts away from competitive uses and into forest management and total production from the managed forest also increases. The increased production in managed forests may also substitute for harvests from the mature natural forest frontier.

Distributive arguments are sometimes used to justify incentive programs on the grounds that they benefit small-holders, thus promoting rural livelihoods. However, ensuring that it is this group that benefits in practice is often challenging. In the US (Boyd and Hyde, 1989) it was observed that those who do take advantage of the investment program are not among either the poorer or the smaller private landowners.

These forms of assistance can substantially improve the competitiveness of domestic producers in both their own domestic market and export markets, and are often used specifically for these purposes. For this reason they can act as trade barriers and can be of far greater importance than tariff barriers. Such forms of assistance occur in many countries though it is difficult to assess the extent to which they create barriers to trade, and whether they have increased in recent years or not. There is evidence however, of a

⁴¹ Time, or the cost of growing capital, is only one input to forest management. We could also trace the effect on the labor and manufactured capital inputs for forestry. However, these are lesser inputs for most forest management and the effect on harvest time has easily been more important. The simplest way to trace any of these effects would be to enter a term for an accumulating tax on production $Q(\cdot)$ in the Faustmann formula, eq. (3b.3), and to determine the resulting changes in the optimality conditions for the harvest period and for labour and manufactured capital inputs, eqs. (3b.8) and (3b.9).

substantial differential between subsidy rates in developed and developing countries. In eleven EU countries the average subsidy for plantation schemes is US\$1,421 per hectare plus US\$761 per hectare for maintenance. In South America, subsidies are less than US\$ 400 per hectare (Cossalter and Pye Smith 2003). While some reductions in subsidies are apparent, there are signs that they may be increasing in countries interested in encouraging further growth in plantations (Bourke 2002). Ecuador and Colombia have adopted a similar incentives model to that of Chile, with Ecuador providing planting and maintenance incentives of US\$300 per hectare (Cossalter and Pye Smith 2003).

Policies on Downstream Processing of Forest Products

A number of policy instruments are commonly used by governments to promote wood processing to increase the potential for export of value-added products or to protect the local industry from international competition. Assistance can be both financial, for example graded tax exemptions for different levels of processing and non-financial through the provision of support services. Trade policy, log export bans specifically, are often used to promote or protect a domestic processing industry. In particular, government sponsored research in wood processing can increase the efficiency of wood utilisation in industrial processing facilities, thus increasing competitiveness and the potential for trade. US government sponsored research for the southern pine plywood industry produced rates of return of 300% per annum throughout the 1960s and 1970s. Cost reductions brought about by research were a critical factor in the expansion of the plywood industry in the southern US. While this increased the demand for southern pine logs, it displaced western pine plywood which made less efficient use of the logs and was more likely to originate from mature natural forests. The effect of this government sponsored research was both to increase competitiveness of the southern pine plywood industry and to decrease US harvests at the natural forest frontier (Hyde, forthcoming).

Government Policies to Promote Forest Environmental Services

Many governments are introducing policies to promote the provision of forest environmental services such as carbon sequestration, watershed protection, biodiversity conservation and landscape beauty. Particular attention is being given to payment and market initiatives in an attempt to tap private sources of finance. At present it appears that provision of carbon sequestration services has the greatest potential to affect international trade patterns for timber.

In the case of carbon these efforts have been driven primarily by inter-governmental agreement on the Kyoto Protocol to the United Nations Framework Convention on Climate Change, which was signed in 1997. This established explicit and mandatory limits on industrialised and transitional nations' greenhouse gas emissions with targets for reductions by 2008-2012. Average required emission reductions for these countries as a group come to 5.2% below 1990 levels by 2008-2012 (Landell-Mills and Porras 2002). The Kyoto Protocol also provides a framework for trading emission rights such that countries wishing to emit more than their limit can purchase rights from others that find it less costly to reduce their emissions. There are three types of trading mechanism set out in the protocol:

- International Emission Trading that allows Annex B countries to trade emission permits;
- Joint Implementation that allows Annex B countries to earn Emission Reduction Units through projects in other Annex B countries;
- Clean Development Mechanism (CDM) which allows Annex B countries to gain certified emission reductions from projects in non Annex B countries ie developing countries.

These reductions may be achieved by reducing emissions or by increasing carbon sequestration and storage. Forests can play a key role in the creation of carbon offsets through four approaches:

- Reforestation/afforestation to increase carbon sequestration;
- Improved forest management eg through reduced impact logging to both increase sequestration and reduce emissions;
- Conservation and protection against deforestation to reduce emissions;
- Substitution of sustainably produced biomass for fossil fuels to reduce emissions.

Timber harvesting activities are also considered as a source of carbon emissions.

Decisions taken in multilateral negotiations (COP 6 and COP 7) on the rules underlying these flexibility mechanisms have placed limits on the extent to which carbon offsets can be generated from forestry. Improved forest management, for example, is not an option for the CDM which is restricted to reforestation and afforestation. Credits from forestry and other land-based sinks will be capped at 1% of country's base year emissions. This has significant implications for the extent of international trade in carbon offsets and the knock-on effects on trade in forest products.

In developed countries (Annex I countries) no credit is given for carbon sequestration from forest cover established prior to 1990 but harvesting from both types of forest ie established before or after 1990 will be counted as an emission activity during the first commitment period 2008-2012. This gives an incentive for increasing the harvesting rate from non Kyoto eligible forests before 2008 (Leitch 2002). This will affect trade patterns in the short term.

In order for the protocol to become effective it must be ratified by at least 55 countries, representing 55% of 1990 carbon emissions. At present the number of countries requirement has been met but not the percentage of emissions requirement. Ratification by a significant source of emissions such as Russia is needed before the protocol can come into force. Nevertheless, many carbon offset projects based on forestry have been developed in anticipation of ratification.

The traditional government role in promoting market-based systems is to establish a conducive policy framework and regulatory environment and facilitate or promote action by the private sector. Australia provides an example of this. In 2000, the Australian government launched a "Bush for Greenhouse" campaign to encourage industry to enter into deals with private landowners for revegetation projects to sequester carbon. Carbon offsets generated under this scheme will be recognised by the Australian Greenhouse Office. However, some governments have also become involved as active buyers and sellers of environmental services and are frequently active intermediaries. A global review of markets for environmental services found that of the 75 carbon schemes examined, governments constituted 16% of buyers, 23% of sellers and 17% of intermediaries (Landell-Mills and Porras 2002).

In some cases these interventions are temporary with the aim of catalysing participation from other stakeholders. This applies particularly to the provision of advisory services, training and information. In other cases the interventions are more long-term. In Costa Rica, the government has established an intermediary institution, FONAFIFO, to bring buyers and sellers together and to guarantee service provision. In Australia, State Forests New South Wales, has been offering immediate sales of, as well as future options to purchase, certified and guaranteed carbon offsets. Deals have been negotiated directly with large international power companies but future plans include the use of specialised brokers and exchange-based trading.

While the policies discussed above will primarily impact on international and domestic trade in environmental services, there may be knock-on effects on trade in forest products. The additional revenue generated by the sale of environmental services will make certain types of producer viable in the international market, while others will be displaced.

There are also implications for forest management. The additional revenues from the marketing of environmental services may be sufficient in some cases to make sustainable forest management competitive with other forest land uses. But the problem confronting any attempt to use trees to control global climate change is the mismatch between the non-exclusive global public impact and the security of specific forest activities required to control it. Only for regions in the third mature stage of forest development, are the costs of establishing and managing forests compensated by the market value of the

resource. Payments for carbon sequestration under the CDM might increase the forest value function and extend the area of sustainable management. As payments for conservation of mature forests are not contemplated within the CDM it is clear that CDM payments will therefore increase intensively managed forest at the expense of forest activities at the forest frontier. The ultimate result may be increased forest cover. But concentration on the provision of carbon in managed forests may work against some aspects of sustainable forest management such as biodiversity conservation. Moreover, displaced producers at the forest frontier may also revert to subsistence agriculture with negative implications for the forest. Alternative solutions might be found in payments for institutions involved in securing property rights.

In terms of biodiversity, it is reasonable to assume that the remaining natural forest, the forest beyond the frontier contains most of the critical habitat. The difference between the conservation of carbon and species lies in the specificity of geographical areas which need to be conserved. Biodiversity requires the protection of selective "islands" of specialized habitat generally at the natural forest frontier or beyond it. The foregone future development opportunities associated with them are often smaller than even the current opportunities foregone when protecting forests for carbon sequestration at the margins of economic activity. This means that many critical habitats remain unthreatened today simply because they are (for now) beyond the limits of economic activities.

Since the prevention of land conversion will be a problem for habitats at new frontiers in regions in the first stage of forest development it may be better to target a reduction in incentives for agricultural expansion in newly settled regions like some parts of the Amazon or the interior of Papua New Guinea. Otherwise, for regions in the second and third stages of forest development the critical issue remains the identification of the most threatened areas. Once these are known the most effective strategy might be the design of roads to avoid critical habitats or long-term investment in the regional institutions involved in securing property rights. In some specific cases, habitats might be able to be protected in the normal course of management for other forest products and forest-based environmental services. Hyde (Hyde, 1991) showed that this is the case, for example, for many red-cockaded woodpecker habitats in the southern pine region of the US. Careful planning of the sequence of timber management activities, with no change in the overall activities themselves, was sufficient to protect this endangered species.

A broad range of people participate in the benefits of environmental tourism and a broad range of forested sites provide for it. The site characteristics range from unique global resources like Yellowstone, the Serengeti, or Sagarmantha to pleasant local forested groves and even village parks. The unique sites are often focal points for substantial demands for tourist support services like restaurants, motels, guide services, and outdoor equipment shops; and these can be important sources of employment for the local economy.

The economic problem is either one of protecting "islands" of specialized forested sites within lands that are valuable for other, extractive uses of the forest or identifying forestlands that are inaccessible for extractive land uses but are uniquely attractive for nature tourism, and protecting them before they become accessible for those extractive uses.

For the most unusual sites, fees can be charged at points of limited access and the collected revenues can be used to establish boundaries and to monitor and enforce the exclusion of undesirable uses of the park. For example, Kenya charges an increased visa fee for the entry for global tourists, Nepal charges for trekking permits which must be obtained at the offices of guide services, and many national parks with natural boundaries charge a gate fee. It is of course necessary to define clearly how such fees can be reallocated in the case of multiple sites of interest.

It is also necessary to monitor and enforce restrictions against the competitive use of land by local people (who are not able to be excluded upon failure to pay such fees). A partial solution to this problem can often be obtained by establishing an interest in the park's tourist services within the local population. Forest resources that are not unique and do not attract global tourists are particularly suited to management by local institutions and we observe many successfully protected village parks and forest sanctuaries around the world. Nevertheless, there are still positive costs and, since the exclusion of local users is difficult, the local community must bear these costs either as part of its community budget or as part of a commonly respected decision not to exploit the extractive resources within the park.

Erosion control and watershed protection incorporate all the services of trees in managing wind, water, and soil movement - either through new planting or conservation of existing forest ecosystems

Watershed values are primarily local. Depending on the watershed management activity, it can be of greater benefit to an individual land owner who makes the conservation investment and improves his or her own land's productivity, or it can yield greater benefit to a range of downstream or other off-site land managers in the same watershed

Many watershed management activities require new planting investments as a means of improving the productivity of existing (often agricultural) land uses. These investments typically occur on the private lands. They have little impact on forestry and increases in the manager's private long-run productivity are generally sufficient to induce the private conservation investment and few additional incentives are necessary (Crosson 1985, Crosson and Stout 1984, Alemu 1999 and Yin 2000) demonstrated its reliability for developing countries as well, once farmers in those countries obtained longer-term land use rights.⁴²

The second class of watershed management activities protects the upland watershed or the coastal wetlands for the benefit of off-site residents of the same local area. Grazing livestock in Africa and the Philippines (Cruz *et al.*, 1988) or upland collection of fuelwood and fodder in Nepal (Dangi and Hyde, 2001) are examples of activities which are targeted. These examples all characteristically occur within either the open access degraded forest or the neighborhood of the mature natural forest frontier in the second and third stages of forest development. The costs of protecting watersheds in these areas exceed open access values and private management will be unsuccessful and only regulation or public ownership along with a degree of monitoring and enforcement can insure the common watershed benefits for the local community.

Finally, some cases require broader regional or national oversight. For example, the Chinese authorities feel that this was the case with the flooding of the Yellow and Songhua Rivers in 1998. Upstream deforestation and construction damaged agricultural lands more than 1500 kilometres downstream.

4.3.3 Environmental Assessment of Trade in the Context of SFM

Starting in the early 1990's, the importance of assessing the relationships between trade and environment has gained increased recognition, both in governmental and civil society sectors. This recognition was initially linked to the increased concern about the state of the global environment, following the UNCED in 1992. Principle 17 of the Rio Declaration says that environmental impact assessments will be undertaken for activities likely to have significant impacts on the environment. The Ministerial Council of the Organization for Economic Development (OECD) recommended, in June 1993, to governments "to examine or review trade and environmental policies and agreements with potentially significant effects on the other policies area early in their development to assess the implications for the other policy area and to identify alternative policy options for addressing concerns". In 1994, the OECD developed general methodologies for conducting environmental reviews of trade policies and agreement and trade reviews of environmental policies and agreements (OECD 1994). In the same years, the North American Agreement on Environmental Cooperation, directed the Commission for Environmental Cooperation (CEC) to consider on an ongoing basis the environmental effects of NAFTA. In 1995, CEC started designing a framework to assist in anticipating important environmental impacts in the context of trade liberalization, and to develop policy tools to mitigate negative impacts and maximise positive ones (Commission for Environmental Cooperation 1999).

Since then, initiatives in this field have increased in number, and involved many stakeholders, led by international organizations, national governments, different sectors of the civil society, research institutions.⁴³

The interests and expectations of different stakeholders in the trade-environment-development nexus have been paralleled by improvement in methodologies and capacities and growing practice of impact

⁴² Landell-Mills and Porras (2002) provided further evidence of the private market nature of some classes of watershed management. They identified over 180 cases of markets for watershed services from countries all around the globe and in a multitude of local arrangements.

⁴³ see for example WWF International website at: <http://www.balancedtrade.panda.org>

assessment studies, including environmental impact assessment. Most countries have now specific requirements for conducting environmental impact assessment of project and activities.

In 2002, the FAO Forestry Department has started renewing its interest in the area of environmental assessment of forest use, including trade in forest products and services⁴⁴ ()

This paper presents the results of a desk study which has reviewed how environmental assessments of trade and trade-related issues have been applied in the forestry sector .

Definitions

The definitions given below have the aim to clarify some of the terms most currently used in the work and research dealing with assessing and evaluating the interactions between economic activities in general (including trade in forest products) and environmental changes. These definitions are not meant to provide any judgement of the value or appropriateness of each of them.

Environmental assessment (EA) can be defined as the general process of assessing environmental impacts associated with human activities. It may include studies ranging from comprehensive (EIA) to more limited reviews (such as environmental audits, etc).

Environmental impact assessment can be defined as a tool to identify and assess the potential impacts of a proposed project (or activity), evaluate alternatives, and formulate appropriate mitigation management and monitoring measures.

Strategic Environmental Assessment (SEA): can be defined as a tool that promotes the incorporation of environmental considerations “upstream” from a project specific EA into policy and programme formulation⁴⁵.

Sustainability assessments are tools for integrating environmental and developmental considerations into trade and investment policies. By involving both government experts and non-governmental stakeholders, sustainability assessments help determine how to maximise the positive effects and mitigate/avoid the adverse impacts of trade and investment policies. Sustainability assessments are more than just “environmental impact assessment of trade”. They should shape policies, put sustainability first, effectively involve stakeholders, change real outcomes⁴⁶.

Sustainability Impact Assessment (SIA). A SIA is a process undertaken during a trade negotiation which seeks to identify economic, social and environmental impacts of the trade agreement. A SIA should help to integrate sustainability into trade policy by informing negotiators of the possible social, environmental and economic consequences of a trade agreement. SIAs should also provide guidelines for the design of possible flanking measures, the sphere of activity of which can exceed the commercial field (internal policy, capacity building, international regulation), and which will make it possible to maximise the positive impacts and to reduce any negatives impacts of the trade negotiations in question. ⁴⁷

Social Impact Assessment (SIA). Social impact assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programmes, plans, projects) and any social change processes involved by those interventions. The primary purpose of a SIA is to bring about a more sustainable and equitable biophysical and human environment.⁴⁸

⁴⁴ see FAO’s website at <http://www.fao.org/forestry/foris/webview/forestry2/index>.

⁴⁵ Source: FAO Investment Centre Environmental Impact Guidelines (November 1999).
<http://www.fao.org/forestry/foris/webview/forestry2/index.jsp>

⁴⁶ <http://www.balancedtrade.panda.org>

⁴⁷ http://europa.eu.int/comm/trade/sia/seminar/index_en.htm

⁴⁸ <http://www.iaia.org>

International Initiatives, Programmes, Approaches and Institutions related to Trade

This article is more concerned with the environmental aspects of the assessment of trade rather than the more encompassing sustainability aspects. It is recognised, though, that there has been a trend, since the first reviews were done, toward more comprehensive assessments.

The main international, national and NGO initiatives related to the assessment of the economic, environmental and social impacts of trade are mentioned below, roughly sorted chronologically.

- Organization for Economic Cooperation (OECD) –Environmental and Trade Reviews
- Commission for Environmental Cooperation (CEC) Analytic Framework for Assessing the Environmental Effects of the North American Free Trade Agreement (NAFTA)
- United States, Canada and Norway national initiatives
- UNEP- Integrated Assessment of Trade and Trade Related Policies
- WWF - “Sustainability Assessment of Trade” Project
- European Commission - Sustainability Impact Assessment of Proposed WTO Negotiations
- Secretariat of the Convention on Biological Diversity – Impacts of trade liberalization on agricultural biological diversity

The main objectives of these trade assessments are to inform the process of decision making of trade policy formulation and the negotiation position of countries. Since the OECD guidelines developed in 1994, these various initiatives have progressively built upon each other and there is a fair degree of convergence in the approaches and methods. However, differences exist, and some of them are introduced in the next paragraphs.

The first aspect, already mentioned is whether these initiatives are environmental assessments only (OECD, CEC) or have the broader approach of the sustainability (EU and WWF) and integrated assessment (UNEP). Recent developments show that there is a trend toward these broader assessments. Another point is that all the initiatives above have a “*trade first*” vs “*sustainability first*” approach, that is, they start with the economic changes that are affected by trade policies and then try to link these to environmental effect. (The environment first-approach would start from the environmental perspective and then incorporate the economic analysis in the study.)

These various initiatives have all developed some sort of frameworks for establishing *causality links* and correlations between trade and environment, in other words, to analyse ways in which trade can affect the environment.

The various initiatives differ for the *subject/scope* of their assessment: the Commission for Environmental Cooperation assesses NAFTA specific rules; OECD methodologies apply to national trade measures and trade agreements among countries; EU focuses on specific trade measures; WWF methodology applies to different types of trade policies, changes in trade policies and measures and UNEP ‘s approach applies to different trade policies. The *timing*, that is, when is the assessment is conducted (ex- ante, ex- post), how long-range effects are considered are other elements of difference in the approaches: for example, the CEC assessment are ex-post (evaluating the effects of NAFTA), while the EU’s SIA is done ex-ante to predict possible impacts.

Other important aspects are the requirements for *stakeholder participation* in the assessment process; and provisions for *monitoring, follow up and policy prescriptions*: for example suggesting accompanying measures to minimise impacts (flanking measures).

Table 4.2 below summarises the features discussed above and other elements.

Applications and Initiatives

The forestry sector and the characteristics of production and trade of forest products have not received much interest in the large body of literature on trade and environment, as compared, for example, to the agricultural sector (for example the crop and livestock sectors have been much more studied in terms of the relationships between trade policies and environmental impacts).

Of the approaches mentioned above none has been specifically developed to address the forest trade and environment linkages and only 2 studies (by CSDDH in Mexico and UNEP in Tanzania) have actually applied the specific trade assessment methodologies to the forestry sector. These studies do an ex-post assessment of the impacts of trade policies (and the general economic liberalization policy related to them) on the wood forest products sector (timber and charcoal principally).

A sustainability impact assessment of the forestry sector is being started by the Institute for Development Policy and Management, University of Manchester under the framework of the SIA programme of the European Union. Country cases will be carried out in Russia, Malaysia, Indonesia, Brazil and Cameroon and results will be available in 2004. (C. George pers. comm.)

The very limited application of the above approaches in the forestry sector doesn't mean that the relationships between forest products trade and environment have not been studied or researched at all. Various studies on the potential effects of trade liberalisation on the forestry sector exist, and a few are somehow based on the approaches developed under the initiatives above.

The point which is made here is that these studies are mainly of a speculative and inferential nature, and are based on expert knowledge, or other literature (rather than on empirical data), as far as the causality links between trade and environmental parameters is concerned. These studies help identify the most relevant issues related to the impacts of trade liberalization on forests and the differing views and perceptions of different stakeholders.

A closely related issue, the impacts that environmental regulations and pressures have on the trade in forest products, has been comparatively better studied. In this category fall, for example, the studies which look at the effectiveness and impacts of trade-influencing measures taken with environmental justification, such as the bans on exports of logs, etc.

Table 4.2: Matrix of approaches

	OECD	CEC	EU	WWF	UNEP
Environmental vs sustainability Assessments	environmental	environmental	sustainability	sustainability	integrated
Trade first vs environment first	economic assessment of the trade agreement or measure	broad economic, environmental, social and political context followed by economic and other direct effects of NAFTA, including institutional effects	Trade measures	Economic changes of major trade measures	economic effects of trade measures
Causality and correlation	Product effects, scale effects, structural effects, technology effects, regulatory effects	Production management and technology, physical infrastructure, social organization	Causal chain analysis. Preliminary assessment to identify potentially significant and non-significant impacts, and to differentiate between impacts of greater and lesser significance.	scale effects, structural effects, products/technological effects, socio-economic effects, environmental effects regulatory effects (including feedback effects)	scale effects, structural effects, products/technological effects, socio-economic effects, environmental effects regulatory effects
Subject and scope	Trade measures and agreements	NAFTA (including rule changes institutions, trade flows, investment and other conditioning factors)	Trade measures (includes a screening process and a scoping phase)	Social and environmental impacts of trade liberalisation	economic, social and environmental impacts of trade-related policies and agreements (ranging from a specific trade measure to multilateral agreements)

cont.	OECD	CEC	EU	WWF	UNEP
Timing	Varies depending on the trade measure of agreement, but generally should be conducted early in the policy-making process	ex-post	ex-ante (includes scenarios to compensate for uncertainty)	Early in the negotiation process (ex-ante) but usefulness of ex-post for lessons learnt	ex post assessments (except one case, China, where an ex-ante assessment was done)
Participation	Varies. Reviews will be carried out by government officials. Consultation is recommended	Work undertaken by a multidisciplinary team with consultation. No requirement for participation apart from institutional obligation of CEC	Developed in consultation with EC and stakeholders	Sustainability assessments should be transparent and participatory	Assessment are done by a multidisciplinary team, recommends participation, recommend stakeholder participation
Quantitative vs qualitative assessment	Mix of methodologies including models, case studies and others	Case studies incorporating qualitative and quantitative approaches	Suggests a mix of quantitative methodologies, along with case studies and social science methods	Relies primarily on qualitative analysis, acknowledges potential of models with caution	A mix of qualitative and quantitative methodologies, macro and micro-level analysis.
Sectoral approaches	Case studies might be used. Recommends development of criteria	Applies to sector studies, includes criteria for selection and upstream and downstream effects into other sectors	Includes case studies in possible approaches	suggests use of sector studies and includes criteria for selection	makes use of sector studies and includes criteria for selection of priority sectors
Indicators for assessment	Suggests preliminary indications within broad topics of pollution, health, safety and resource effects	includes indicators from air, land, water and biota and indicates criteria for selection of indicators	core sustainability indicators: economic, social and environment	propose qualitative judgements to assess impacts	use social, economic and environment indicators

contin.	OECD	CEC	EU	WWF	UNEP
Monitoring, follow-up and policy prescription	Importance of monitoring results and following up and suggesting policy responses	No provision for policy recommendations	Acknowledges the need for mitigating and enhancing measures to reduce or eliminate significant negative impacts, and includes criteria and a method for selecting such measures	Includes a prescriptive analysis with policy recommendations	Prescriptive analysis with policy recommendations

(Adapted from WWF report of the International Experts' meeting on sustainability assessment of trade liberalization, Quito, Ecuador, March 2000). This recent WWF study presents in clear and comprehensive way a synthesis of the different initiatives and their approaches. The report, together with other relevant, comprehensive information on all past and ongoing initiatives, approaches, and methodologies is found on the WWF Sustainability Assessment of Trade website. The site can be accessed at the internet address: <http://www.balancedtrade.panda.org>

- *Improving the understanding of supply and demand relationships for environmental services from forests.*
 - Determining scientifically the linkages between forest management and flow of environmental services from forests in a situation, where services are produced jointly
 - Developing ways to integrate biodiversity conservation, watershed management and carbon sequestration in natural forests into a bundled service
 - Quantifying the relations between water quality, flow regulation, sediment prevention, water supply and aquatic productivity based on various land-use practices
- *Supply studies focusing on transaction costs.*
 - Developing mechanisms for commoditising environmental services so that the commodity's nature and extent is unambiguous, and its delivery and use can be measured and enforced at a reasonable cost
 - Identifying ways of decreasing the most critical transaction costs, paying special attention to the potential of developing markets for bundled services, and improving the distribution of these costs so that the incentive framework is improved.
- *Develop standard verification and certification tools applicable to environmental services from forests*
 - Identifying appropriate measures of service flows and developing monitoring, verification and certification methods for them
 - Standardising watershed service definitions and measurement
 - Developing low cost certification systems for forest environmental services, building on already existing forest certification schemes
- *Studying the cost-effectiveness of various market-based mechanisms used to pay for forest environmental services.*
 - Comparing the cost-effectiveness of various mechanisms (including government service delivery), paying attention to the distribution of costs and benefits among the stakeholders
 - Studying the incremental benefits from applying these mechanisms to see if they really make a difference in the behaviour of producers and consumers
 - Identifying the pre-conditions, which need to be put in place to improve the functioning of these mechanisms
 - Identifying those conditions, where the responsibility for delivering an environmental service could be delegated to a market, and identifying the role that the government needs to play in setting up, regulating and promoting market-based transactions

In what Ways can Trade Measures Impact the Environment?

The North America Commission for Environmental Cooperation identifies 6 hypotheses on the effects of NAFTA induced liberalization:

- Can reinforce existing patterns of comparative advantage and specialization, concentrating production and transportation where it takes place more efficiently (concentration in larger firms, with high visibility which can adopt higher/social environmental standards) or conversely in areas unsupported by adequate physical infrastructure or institutional capacity to handle that growth. [This is what the study by Sizer et al 1999 argues, that especially in tropical countries, (where forests have the highest social, cultural and environmental value), this second hypothesis is probable].
- Economy wide liberalisation can intensify competitive pressures, and this in some case can lead firms to lower inputs, in part reducing environmental protection or pressuring the governments to reduce environmental standards.... [Race to the bottom in the absence of offsetting interventions].
- Liberalization could lead to economic growth that promotes modernization and reduces environmental stress: competitive market pressure can hasten capital and technological modernization. Favouring producers with new efficient and clean plants and equipment
- Liberalization in specific sectors can lead to substitution of imported environmentally superior products for domestic alternatives. Conversely, some liberalization could may lead to a surge in imports that disrupt domestic production, employment, traditional technologies, and social institutions required to maintain the environmental infrastructure

- Liberalization can affect corporate practice and government policy by creating an upward movement of environmental standards and regulations toward a common regional norm (of course North America)
- NAFTA and its institutions (including CEC) could engender a regional awareness and sense of responsibility that reduce the possibility of not caring for poor environmental performance

The framework for understanding the links between trade and environment is based on processes of production, physical infrastructure, social organization and government policies.

In a practically identical way, the OECD identifies 5 relevant categories of types of effects through which trade impacts economic activities and subsequently the environment (this approach is also followed by UNEP):

- *Product effects*: associated with trade in specific products which can enhance or harm the environment;
- *Technology effects*: changes in the way the products are made depending largely on the technology used;
- *Scale effects*: these are associated with the overall level of economic activity or macro-economic effects resulting from the trade measures/agreement: positive ones are from higher levels of economic growth (accompanied by environmental policies), negative ones are when higher economic activities, trade or transport bring increased pollution or faster draw-down of resources;
- *Structural effects*: changes in patterns of economic activities or the micro-economic effects resulting from the trade measure or agreement. Positive structural is when efficient allocation of resources and efficient patterns of productions are promoted; negative is for example when environmental costs and benefits are not reflected in the price of the traded goods;
- *Regulatory effects*: associated with the legal and policy effects of trade measures or agreements on environmental regulations, standards and other measures. Positive ones are when trade measures and agreement take care to maintain ability of government to pursue appropriate environmental measures (see the whole dispute about NTB, SPS); negative when this ability is undermined by the provisions of the trade measures or agreement.

The OECD methodology also identifies the following broad categories of effects on the environment:

- *Pollution effects* (changes in emissions of noxious substances into the air, water or land, including solid wastes);
- *Effects on health and safety* (changes in the raising or lowering protection of human, animal and plant life and health: sanitation, potable water, chemical substances in foods, spread of pests, and environmental-related diseases such as the toxic effects of hazardous waste);
- *Resource effects*: (changes in the use of energy or natural resources: changes in the destruction of habitats and ecosystems, changes in the depletion of species, changes in land use patterns.
- *Environmental effects* can be national, transboundary or global, and these levels are all interrelated.

Trade liberalisation, trade distortions and trade agreements are the three broad areas of trade-related policies which have been the scope of environmental assessments in general, not limited to forestry.

All of the three areas have been considered in the forestry “trade-environment debate”, which has revolved mainly around the following issues:

- Elimination, reduction of tariffs and tariff escalation
- Non-tariff measures (which have been included as trade barriers in the context of trade negotiations) which have been grouped in the following categories (Sizer et al. 1999.): quantitative restrictions on imports: phytosanitary standards (for example the use of toxic fumigants, etc); technical regulations designed to protect human health and safety; labelling requirements; requirements for recycling and waste recovery; subsidies, tax breaks and export promotion, and other financial support measures; export restrictions
- Bi lateral and regional trade agreements
- Trade-distorting policies (subsidies, export bans, etc)
- Impacts of multi-lateral environmental agreements (much on CITES, some on CBD, much less so on UNFCCC and UNCCD) on trade of forest products;
- Impacts of agricultural liberalisation on forests: changes in land uses.

What Challenges as far as the Interactions between Trade and SFM are concerned?

The review of the literature on environmental assessment of trade would support the thought that impact assessment has the potential to be a useful tool for the integration of trade and environmental policies and not only predict/quantify negative impacts. EA of trade-related policies can enhance stakeholders understanding of the implication of multilateral trade rules on sustainable development and environment, and can represent a negotiating tool for resolving environmental conflicts around trade and SFM.

However, the experiences in carrying out rigorous and comprehensive assessment of the environmental impacts of trade in forest products have been limited to date. It is therefore not appropriate here to generalize conclusions from these about the potential of environmental assessment of trade assessment to mediate between objectives of trade and of SFM. Furthermore, FAO is new to these issues (and institutionally never been particularly interested/involved in the debate or international developments) and this does not put us in the best position to recommend or suggest ways ahead (all of the information in this paper here has been taken from other sources).

The few conclusions in box 2 resulting from the review of forest-trade literature show that concerns about negative social and environmental impacts triggered by trade policies and practices are real, that direct and indirect linkages exist and that these are very complex.

Box 4.1 Concerns about Social and Environmental Impacts of Trade in Forest Products

The trade and environment debate has settled into the assumption that trade in itself has no direct environmental links. Trade policies and practices impact the environment via changes in levels and patterns of production and consumption of forest

Compared to macroeconomic policies and trade-distorting policies, trade liberalization policies have proved less influential in determining production, consumption effects and consequently environmental effects.

Trade policy initiatives in the forestry sector have befitted very little from analysis of the potential socio-economic impacts they might have.

It is difficult to link changes in the forestry sector directly to trade liberalisation.

Efficiency improvement that result from trade liberalization may have either negative or positive consequences for the environment depending on the specific circumstances

The main problem in forestry is the weakness of empirical data. Many conclusions are drawn on an inference basis. Findings, forecasting, etc are based on various environmental economics theories (comparative advantage, externalities, the Environmental Kuznet curves which link income level and environmental degradation...)

In trying to assess the impacts from an environmental point of view, questions of particular relevance are the conditions under which increasing timber values protects the forests or encourages exploitation, the determinants of the distribution of production across secondary, primary and plantation forests in different regions, the degree to which plantation production is likely to substitute for production from other sources. This means also to look beyond the macro-economic level (whether and how much trade liberalisation will results in increased logging) to determine how it will affect geographical/regional production and consumption patterns

Changes in trade regulations are likely to have an effects on the volume of trade and therefore on levels of production of some forest products.

Among the most important environmental changes brought by changes in trade policy there are the changes in land uses (by altering production in sectors that compete with forests for land)

To the extent that trade encourages overall economic growth, downstream product industries may experience a trade-induced boom which can put additional pressure on the forest. At the same time, increasing incomes may generate greater demand for environmental services produced by the forests. Environmental Kuznet curves:- Environmental degradation increases with income at low income levels and decreases with income at higher level. However, no robust conclusions have emerged regarding relation between income levels and forest cover.

Basic framework for assessing readiness of countries to trade liberalization from an environmental and social perspective. Criteria:

existence of selected forest protection policies

existence of selected forest protection laws

enforcement

Some environmental impacts of trade liberalization: increased consumption of wood products from poorly managed forest; overexploitation of tree species; trade pressure on less-protected forests; shifts to plantations; expanding trade with countries that subsidize logging (eliminating subsidies would reduce logging in more inaccessible areas); restricting consumer access to information; government procurement; spread of invasive species

The objective of doing trade impact assessment is to find ways to formulate mutually supportive policies by deepening the understanding of the complex relationships between trade and (in the case of forests) forest and trees use/depletion, and by putting stakeholders (governments and civil society) in the position to access this information and inform their negotiation position.

Three aspects are mentioned here which are considered relevant for SFM:

- *the integration of the work on criteria and indicators for sustainable forest management in environmental assessment of trade*

It has been argued that in assessing trade impacts, forests should be considered differently from other sectors because of their very high biological, cultural, and social values. These important values of the forests are reflected in the concept of SFM and in the work done to develop and agree on criteria and indicators for SFM at local, national and international level.

All the frameworks and approaches developed to assess the impacts of trade rely on the use of indicators of environmental or social or economic sustainability. However, this study has found an important gap at this level: there is no link, in the studies reviewed, to the existing C&I for SFM developed under national and international initiatives, nor to principles and standards for forest and forest product certification.

A useful path to follow would be to see how this convergence can be encouraged, and in this, the lessons from other sectors (such as agriculture and fisheries) can be useful. For example, the work of the OECD on the development of agri-environmental indicators for policy purposes in assessing the environmental effects of trade, and the work of the CBD secretariat on the impact of trade-liberalization on agricultural bio-diversity can provide useful indications.

- *the issue of capacity building*

There exist a clear problem of capacity in the countries to carry out impact assessment of trade and trade-related policies. This aspect is widely recognised and considered a priority by all main actors in this field (UNEP, WWF International, and EU for example).

4.4 Developments in Forest Based Industry Sector

4.4.1 Links between Trade, Financing and Structure of the Forest Products Industry

A concern expressed by many NGOs is that companies in the forest products sectors have an increasing amount of power and that transnational companies are playing a greater role. A number of studies (EIA 1996; Dudley *et al* 1996) cite the statistic originating from a UNCTC study carried out in the 1980s (UNCTC 1985) that the percentage of world forest product trade controlled by transnational corporations is between 80 and 90%. The current evidence for this is not very clear given the time that has elapsed since the UNCTC study was conducted. It is easy to point to recent mergers of pulp and paper companies, or to specific countries where forest holdings are concentrated amongst only a few, mainly foreign-owned companies. However, paper production is only one part of a complex, multi-product sector and sectoral characteristics can vary from country to country. Even if it is possible to marshal evidence of increasing market concentration and transnational involvement, it is necessary to ask whether this matters and if so why. Such trends may be a normal part of industry restructuring in response to changes in the overall economic environment and may be no more pronounced than in other sectors.

This chapter examines how the structure of the forest products industry is linked with the expansion of trade and the impacts of trade on forest management. The term industrial structure is used here to refer to some key characteristics of the forest products sector which are thought to influence the conduct and performance of companies within it. These include characteristics related to:

- *market concentration* - the number of sellers and buyers at different stages in the production chain, the extent of horizontal integration and the presence of barriers to entry,
- *production chain relationships* – the extent to which companies at one stage of the chain control other stages through vertical integration or through the terms of their contractual arrangements e.g specialised sub-contracting and outsourcing.
- *ownership* – in particular, the extent of transnational ownership

There are potential advantages to changes in the structure of the forest products sector. Larger companies can exploit economies of scale and so increase efficiency. Mergers of companies can lead to cost savings through reorganisation of production. Vertical integration can reduce transaction costs. Foreign-owned companies can bring new technology and skills and the injection of additional capital can enable a more long-term perspective, crucial for sustainable forest management. Yet there is concern that these advantages will either not materialise or that the benefits will accrue to large, powerful companies rather than to local communities, landholders or governments. Thus, the World Rainforest Movement points to the huge profits of transnational companies and banks and the cheap prices paid by consumers at the expense of loss of natural capital to local peoples such as the Baka pygmies in Cameroon, the Nahua people in Peru and the Saramaka people of Suriname (World Rainforest Movement 2001).

It is therefore important to study the changes in industrial structure which have taken place in the forest products sector at an international level and more specifically in different countries, to examine what has driven these changes, in particular the link with trade and trade liberalisation efforts, and to assess implications for the extent of sustainable forest management and the benefits and costs which accrue to different groups from forestry.

This cannot be accomplished with any great precision as the sector is heterogeneous with marked differences in trends between products and regions. A general analysis of trends in the structure of the forest products sector and their likely implications is supplemented by detailed examination of the situation from three case studies in Ghana, Philippines and Brazil. These countries were chosen because tropical timber harvesting and processing plays an important role in all three. In Ghana and the Philippines there has been a substantial export trade in tropical timber products and also marked changes in the structure of the sector. Brazil is of interest because of its dual role as a pulp and paper producer and tropical timber exporter. We also draw from recent IIED research on small and medium forest enterprises and on private sector participation in sustainable forest management.

Changes in the Structure of the Forest Products Sector

The forest products sector is heterogeneous with many different products, species and technologies. In terms of industrial structure some broad distinctions can be made by:

- Location of the resource base: Temperate/boreal regions and tropical regions.
- Product groups: the two main categories being paper products and those primarily concerned with solid wood products. However, many companies produce both in temperate regions.
- Species: Hardwoods and softwoods

This creates some anomalies as processing may not take place in the same location as the resource base and some countries like Brazil, have plantations in both temperate regions and tropical regions.

It is also necessary to consider the characteristics of the different stages of the forest product value chain from the resource base through to the final consumer. The two main stages of concern are the resource base and processing but it is important to understand how these compare with and are linked to distribution activities and the customer or buying sectors.

We examine trends in market concentration and barriers to entry at these two main stages and the extent to which there is vertical integration or disintegration. As data is limited, this analysis draws heavily on industry perceptions of trends as expressed in a working group on industrial structure at the Expert Consultation on Trade and Sustainable Forest Management Interactions, hosted by FAO in February 2003.

Market concentration is of interest because it serves as an indicator, albeit imperfect, of the extent of market power of companies in the sector and their ability to charge higher prices than under more competitive conditions. Many empirical studies have been done of the relationship between concentration and price in a number of sectors and the majority have found a significant positive relationship between concentration and price (NERA 1999 citing Weiss 1989). It is also necessary though to examine the extent of barriers to entry. Increasing concentration may not translate into the ability of companies in the sector to exploit this by charging higher prices than under more competitive conditions as this will attract new entrants to the market. It is also important to consider market power relative to that of companies in the preceding and successive stage of the value chain. Companies may have market power in relation to their suppliers but may themselves be faced by concentrated buying sectors. Conversely, they may encounter more concentrated supplying sectors. Competition policy, aimed at curbing market power, has traditionally focused on the impact of seller power on consumer welfare and has given less attention to the impact of buyer power, exercised by concentrated buyers against their suppliers (Dobson, Waterson and Chu 1998).

Vertical integration, which refers to the extension of activities, often through merger or acquisition of existing firms, to upstream or downstream activities in the same value chain, is important because it can affect the extent of barriers to entry.

4.4.2 Market Concentration and Vertical Integration

Temperate and Boreal Regions

The size of supplier varies considerably and hence the extent of concentration. The US and Northern and Central Europe are characterised by a high degree of participation of small private forest owners who supply timber to pulp and paper and wood processing companies. There are estimated to be 12 million private forest landowners in Europe (Swedish Forest Industries Federation). But many of the large companies in the forest products sector have extensive land holdings. International Paper is the largest private landowner in the US with 10 million acres (and holdings of 10 million acres in other countries, Canada, Russia, Brazil and New Zealand) (International Paper 2002a). Most companies rely on a mix of own holdings and third party suppliers. It is rare for processing companies to have no forest holdings and to buy in all their wood raw material requirements but also rare for a company to be entirely dependent on its own forest holdings for supplies. Canada is distinct from other main producer countries in that forest lands are mainly publicly owned and allocated by concessions, so there is less small landowner involvement. But the situation is different for First Nation forest reserves. Depending on provincial laws

the sector in most countries. International Paper, the largest company in the sector globally, itself started in 1898 as a merger of 17 pulp and paper mills (International Paper 2002b). In the US, the average number of firms per paper product category declined from about 70 in 1978 to about 60 in 1992 in a period when total capacity in the sector increased by 20%. About 40% of the 819 paper and paperboard plants operating in the US in this period were involved in at least one merger (Pesendorfer 1998).

The sector, while more concentrated than solid wood activities, is considered fragmented in comparison with some other manufacturing sectors. This can be seen from data on concentration ratios for the US in Table 9.1, which shows that the top four firms in manufacture of transportation equipment accounted for around 50% of output while the top four in the paper manufacturing sector controlled less than 20%. However, of the 21 sectors listed, only six have a higher four-firm ratio than the paper manufacturing sector and only five have a higher Herfindahl-Hirschmann index. Nevertheless, the four-firm ratio for the paper manufacturing sector is below common benchmark thresholds for market power such as the Scherer-Ross threshold of 40 (Johnstone 1996). Moreover, empirical research on the effects of concentration in a number of sectors suggests that the four firm ratio could be as high as 50% before there are any significant effects on price (NERA 1999 citing Weiss 1989).

Table 4.3 US Concentration ratios by value of shipments 1997

Industry (3 digit NAICS)	Four-Firm ratio ¹	Herfindahl-Hirschmann Index ²
Food manufacturing	14.3	91.0
Beverage and tobacco	45.1	777.2
Textile mills	13.8	94.4
Textile product mills	22.8	186.2
Apparel manufacturing	17.6	100.6
Leather and allied products	19.0	167.2
Wood product mfg	10.5	52.7
Paper mfg	18.5	173.3
Printing and related	9.6	38.4
Petroleum and coal products	26.0	350.0
Chemical mfg	11.9	76.6
Plastics and rubber mfg	8.2	30.2
Non-metallic minerals mfg	9.1	52.1
Primary metal mfg	13.8	97.4
Fabricated metal mfg	3.5	8.5
Machinery mfg	11.5	55.4
Computer and electronic product mfg	19.1	136.6
Electrical equipment	14.8	105.9
Transportation equipment mfg	49.7	797.6
Furniture and related	11.2	55.5
Miscellaneous mfg	7.4	33.2

1. The percentage of value of shipments accounted for by the four largest companies

2. The sum of the squares of the individual company percentages for the 50 largest companies or the universe, whichever is lower. Source: US Census Bureau 2001

Table 4.5 shows concentration ratios at a more disaggregated level for the US. It can be seen that pulp, paper and paperboard are quite concentrated with newsprint and pulp both exceeding the benchmark of 40. The converting sectors are more heterogeneous so there is wider variation within these sectors.

Because of changes in 1997 in the sectoral classification of industry used by the US census from Standard Industrial Classification System (SIC) to the North American Industry Classification System (NAICS) care has to be taken in comparing with concentration ratios from earlier censuses, particularly for higher level groupings. It is notable though that the 1992 figure for the sector paper and allied products is 18, very similar to the 1997 ratio. Analysis by Johnstone of concentration ratios at a more disaggregated level from 1967 to 1987 in the US, showed that in most cases market shares of the four largest firms did not increase in this period. Exceptions were for sanitary products, newsprint, and paper mills (Johnstone 1996).

Table 4.4 Concentration ratios by product category based on value of shipments

4-5, and 6 digits NAICS	Four Firm Ratio	Herfindahl-Hirschmann Index
Pulp, paper and paperboard mills	28.0	356.0
- Pulp mills	58.6	1,106.4
-- Paper mills	37.6	541.7
-- Newsprint mills	43.9	766
- Paperboard mills	33.6	485.1
Converted paper product manufacturing	12.0	96.2
-Paperboard container mfg	19.2	175.8
- Paper bag and coated and treated paper mfg	27.1	266.7
- Stationery product mfg	27.5	296.9
- Other converted paper product mfg	42.3	688.1
--Sanitary paper product mfg	63.1	1,481.0
--All other converted paper product mfg	23.0	187

1. The percentage of value of shipments accounted for by the four largest companies
2. The sum of the squares of the individual company percentages for the 50 largest companies or the universe, whichever is lower. Source: US Census Bureau 2001

In some developing countries, production is more concentrated than in the US. In Chile, in 1997 pulp production was carried out by just five companies and one company accounted for 50% of pulp exports (Borregaard and Dufey 2001). In South Africa, the four main groups – Mondi, Sappi, Nampak and Kimberly produce 98% of the country’s pulp, paper and board (Mayers *et al* 2001).

The definition of market, however, is crucial for the calculation of these concentration ratios. If companies can sell their products worldwide and a national market can be freely supplied by imports, national concentration ratios may be inappropriate. Taking a global perspective, it is clear that concentration has increased but is still not close to the threshold levels set out above. In 1993, the top four and top ten paper companies produced 9.6% and 19.4 % respectively, of the world’s output of paper and board. By 2001 these shares had increased to 16% and 28%, reflecting mergers between companies like Stora and Enso, UPM and Kymmene, International Paper and Champion International. As with national level data, this level of aggregation masks considerable variation between paper grades.

There are also sizeable barriers to entry to pulp and paper manufacturing because of the capital intensive nature of the activity and the potential for economies of scale. The capital intensity can be demonstrated by data from the US. In 2000, the ratio of fixed assets to gross output in the paper and allied products sector was 1.83, compared to an average for US manufacturing of 1.15. Another indication of capital intensity is given by mill size which has steadily increased over the years as companies endeavour to exploit economies of scale. Table 4.6 shows how average mill capacity increased in Sweden between 1960 and 2000.

Table 4.5 Average Pulp, Paper and Paperboard Mill Capacity in Sweden

Year	Average Mill Capacity ('000 tonnes per annum)	
	Pulp	Paper and Board
1960	45	30
1970	90	70
1980	145	115
1993	225	185
2000/01	269	231

Source: Johnstone 1996 and PPI 2002

On the buyer side there has also been consolidation, particularly amongst media companies, which are large buyers of newsprint and coated papers, and packaging companies.

Softwood-based paper production in temperate countries is typically integrated with solid wood production because the residues from lumber production can be utilised in pulp manufacture. Many of the leading paper companies in North America and Europe also have solid wood product divisions. Production based on hardwoods is more likely to be separate.

Overall, the solid woods industry is fragmented . Overcapacity and low barriers to entry mean that profitability is generally rather low. This applies particularly to the hardwoods segment. Consolidation is more evident though in the engineered wood products sector which is more capital intensive. Some indication of the extent of concentration in the US is given by Table 9.1 in the previous section which shows that of the 21 three digit NAICS sectors, only five have a lower four-firm concentration ratio and Herfindahl-Hirschmann index than wood product manufacturing.

As with the pulp and paper sector there is considerable variation within industry activities as shown in Table 9.4 with ratios for veneer, plywood and engineered wood products that are close to or exceed the benchmark thresholds.

South Africa provides a contrast to this general lack of market concentration. The five largest owners of sawmills, account of 70% of total production while some 220 small-scale mills produce only 10% of sawlogs (Mayers *et al* 2001).

Overall the solid wood sector is less capital intensive than pulp and paper and manufacturing generally. However, there are likely to be marked differences within the various industry sub-categories. In the US in 2000, the ratio of net private fixed assets in the lumber and wood products sector to value added was 0.79 compared to an overall average for manufacturing of 1.15.⁴⁹

The extent of consolidation in the distribution and buying stage of the value chain depends on the type of wood and the region. Distribution is concentrated in the US particularly for softwoods and there are signs of increasing consolidation in Europe. Buying sectors such as DIY and construction tend to be fragmented in Europe but concentrated in the US. Buyers of hardwoods are generally considered to be fragmented in both Europe and US.

Table 4.6 US Concentration Ratios for Wood Products by Value of Shipments

Industry - 4,5 and 6 digits NAICS	Four-firm ratio	Herfindahl-Hirschmann Index
Sawmills and wood preservation	14.5	86.7
Veneer, plywood and engineered wood product mfg	26.9	286.9
--Hardwood veneer and plywood mfg	30.5	430.4
--Softwood veneer and plywood mfg	48.8	914.9
--Engineered wood member (except truss) mfg	77.1	2,453.5
--Truss mfg	8.8	42.4
--Reconstituted wood product mfg	42.9	592.3
Other wood product mfg	12.7	66.8
-Millwork	16.1	100.9
-Wood container and pallet mfg	5.8	15.9
-All other wood product mfg	26.3	257.9

There are a number of possible routes for vertical integration. As processing encompasses two stages of production, pulp manufacture and paper manufacturing, the most obvious route for integration is to combine these two stages. Although there is still a sizeable market pulp sector, the overall trend has been to integrate pulp and paper production. In Sweden, in 1960 just over 40% of pulp production was integrated with paperboard manufacturing, while in 1990 this figure had risen to over 80% (Johnstone 1996 citing ILO 1992). The US pulp and paper industry is highly integrated with market pulp accounting for only a small percentage of production or consumption, but Canada presents a contrast with some 65% of chemical pulp output being non-integrated (Paperloop 2001). This is the result of both technological integration ie the physical integration of production processes and institutional integration ie mergers or acquisition of firms engaged in different stages of the production process (Johnstone 1996).

Forward integration of processing companies into distribution is perceived to be on the increase at a global level. This is to facilitate global market access. Forwards integration from processing and distribution into buying sectors and backwards integration from buyers is less common than for earlier stages in the value chain, though there is variation between product categories. It is very rare for newspaper publishers to acquire or be integrated with newsprint manufacturers. In packaging sectors more vertical integration is typical and is not a recent trend. According to a study carried out in the early 1990s in the US 75% of corrugated case making was owned by paperboard mills (ILO 1992 cited in Johnstone 1996). Some of the top companies in the pulp and paper sector have major packaging divisions, for example International Paper.

⁴⁹ Calculated from US DOC SCB Sept 2001 and November 2001

As with the pulp and paper sector, there is a trend away from backwards integration to divestment of forest land by processing companies but this is more marked for Europe than for the US.

There is some forwards integration into distribution and end use sectors but this is less evident than for the pulp and paper sector and applies more to larger companies. Weyerhaeuser, for example is engaged in the growing and harvesting of timber, manufacture, distribution and sale of forest products and real estate construction.⁵⁰

Diversification and Specialisation

Preferences for diversification and vertical integration change over time, often in line with business cycles. A study of forward vertical integration for Canadian and US producers of structural panels and softwood lumber in the 1980s found that there was decreasing reliance during this period on forward integration into distribution. The authors attributed this to the recession of the early 1980s which led to companies increasing their focus on core industries (Cohen and Sinclair 1991). However, this move away from forward integration did not apply to the larger firms.

It is therefore reasonable to assert that the leading companies have steadily widened their range of products and businesses over the years, often through mergers and acquisitions. A more recent trend though, is for companies to divest non-core assets and to concentrate on core businesses. Stora Enso, for example, has moved out of energy generation and specialty paper for this reason (Paperloop 1999) Georgia Pacific has recently announced plans to sell a majority stake in its global paper distribution subsidiary and to split into two companies, one concentrating on consumer products and packaging and the other on building products and distribution. This offsets to some extent the trend towards horizontal and vertical integration.

4.4.3 Resource Base and Processing in Tropical Regions

There is considerable variation depending on whether forest land is privately owned or held under concession and on whether natural forests or plantations are involved. For natural forests, the solid wood sector is fragmented at the resource stage. Where forest land is allocated by concession as in West and Central Africa, and some Asian and Latin American countries, there is scope for concentration. But in Central Africa there are legal restrictions on the size of concessions which limit the possibility of expansion. The view of the private sector operating in these countries is that these limits do not permit operation at an economically viable level. In Latin America, there are variations within the region in relation to land ownership. In Brazil forest lands are privately held and as a result reliance by wood processing companies on outside suppliers for part or all of their raw material requirement is common. In Bolivia and Peru there is a system of forest concessions.

Where production is largely based on plantations, the overall trend is towards expansion of landholdings. However, outgrower schemes involving local communities are quite common and vary from simple leasing of land to joint ventures between the company and the smallholder. Motivations vary – usually the desire to improve the company image and relations with the local community is important but in some cases it may be the only way to get access to land.

- Aracruz in Brazil initiated its outgrower schemes to increase its fibre supply after protests against companies owning large tracts of land prevented it from expanding its land holdings
- The Phoenix Pulp and Paper company in Thailand after having little success with large scale plantations now sources all of its raw materials requirements from small-scale farmers through direct purchase or outgrower schemes
- Stora Enso and the Indonesian company Inhutani III jointly run an outgrower scheme in West Kalimantan on government land to which local people hold traditional user rights. The main aim was to avoid conflict with local people (Mayers and Vermeulen 2002).

As in temperate regions, contracting out of harvesting activities is common in some countries, for example Guyana. Solid wood sectors in tropical regions are typically less concentrated than manufacturing sectors on average. This is illustrated by the case of Brazil. Table 4.8 shows that the concentration in the forestry

⁵⁰ News Release October 22 2002 www.weyerhaeuser.com

sector is only slightly higher than the Brazilian average, but considerably smaller than in the pulp and paper sector. Wood processing and furniture production are both less concentrated than average. In Ghana concentration in the tertiary sector is very high but this is based on exports only (Table 4.9). A problem common to many tropical timber countries is excessive processing capacity in relation to forest resources.

Table 4.7 Herfindahl indexes for the main forest activities in Brazil, 2000

Economic activities	Herfindahl index
Forestry operations	1849,0
Processing industries (excluding pulp and paper)	1688,1
Pulp production, paper and paper products	2562,8
Furniture production and diverse industries	1643,1
Brazil (all activities)	1813,0

Source: Young and Prochnik 2003

Table 4.8 Concentration ratios (based on volume of exports) Ghana

Sector	Before 1995		After 1995	
	Market share of 4 largest firms	Herfindahl Index	4-firm ratio	Herfindahl index
Primary	31	462	6	7435
Secondary	16	na	18?	Na
Tertiary	68	1,406	63	1,137

Source: Amponsah (2003)

Distribution is concentrated in Brazil and Latin America generally with just a few intermediary companies controlling exports of tropical timber. Companies rely on intermediaries because they do not produce sufficient volume to justify taking on this function. In Asia the situation is different, there are more companies involved in distribution because of the larger volumes. In Africa, the producer companies employ representatives to take charge of distribution. Buying sectors are quite specialised and fragmented.

Vertical Integration in Tropical Regions

Log export bans have stimulated forward integration from logging into processing in many countries. Forward integration into distribution is common only where there are large volumes involved. Forward integration from processing into buying sectors is not very common. But specialised sub-contracting arrangements are becoming common in the solid wood sectors and are particularly important for furniture. 75% of Malaysia's furniture exports are produced under sub-contracting arrangements (ILO 2001).

The last fifteen years has seen a spate of merger and acquisition activity in the forest products sector both within and across national boundaries. For example, outward FDI from Finnish forestry firms increased tenfold over the period 1988 to 1998 (ILO 2001).

4.4.4 Transnational Involvement

Many of the leading pulp and paper companies, which in the 1960s and 70s typically operated solely in their home country, now have a global reach with forest operations, manufacturing facilities and distribution activities in a range of countries. However, only one company in the paper sector, Stora Enso, was included (at number 54) in UNCTAD's top 100 non-financial transnational corporations, ranked by foreign assets in 2000 (UNCTAD 2002).

The biggest deals in the pulp and paper sector are typically between companies in developed countries and intra-regional investment predominates. North-South foreign investment, has been relatively minor compared with trends in the solid wood sector but is on the increase. There is also some South-South investment and South-North investment in the sector. However, only one paper company, the South African company Sappi, is included (at number 11) in UNCTAD's top 50 non-financial TNCs from developing economies, ranked by foreign assets, 2000.

The bulk of foreign direct investment in the pulp and paper sector in developing countries is concentrated in Latin America in fast-growing plantations. Even so the amounts involved are not commensurate with the economic importance of the sector and the overall amounts of foreign direct investment in the economy. In Brazil, the forest products sector contributed 6.9% to GDP in 2001 but accounted for only 2% of total FDI stocks (Macqueen *et al* 2003). In Chile, FDI has played only a minor role in the development of the pulp and paper sector (Borregaard and Dufey 2001).

There has perhaps been less foreign direct investment in solid wood sectors in developed countries than in the pulp and paper sector. In the US, data from 1990 shows how the lumber and wood sector were less international than the pulp and paper sector and manufacturing in general. Foreign-owned lumber and wood product firms in the US contributed only 2.9% of sectoral value added, compared to 7.9% for paper and allied products and 13.4 for manufacturing in general (Johnstone 1996).

Box 4.2 Foreign Direct Investment in Tropical Forest Industries

<p><u>Africa</u></p> <p>Cameroon - 90% of logging companies are foreign-owned</p> <p>Central African Republic – Seven of the nine major concessions are held by foreign companies (French, Lebanese and Malaysian)</p> <p>Côte d'Ivoire - 85% of the capital stock in the forest industry is foreign-owned</p> <p>Gabon - The major forest companies are mostly subsidiaries of European firms but Asian investment is becoming more prominent.</p> <p>Ghana – About 20% of forest product companies are wholly or partly foreign-owned (Canada, Germany, India, Lebanon, Liechtenstein, Netherlands, Taiwan, UK) (Amponsah 2003).</p> <p>Liberia - 84% of forest land allocated under concessions is held by foreign companies (Malaysian, Lebanese, European and Indian)</p> <p><u>Asia-Pacific</u></p> <p>Malaysia – 38% of the investment in wood processing in 2001 came from foreign companies (Singapore, Japan, Taiwan, Germany, China, Korea, Switzerland, and USA. But forest concessions are 100% local-owned.</p> <p>Papua New Guinea – The forest industry is 90% foreign-controlled (Malaysia, Japan, Europe, Singapore, Korea, China and Australia)</p> <p><u>Latin America and Caribbean</u></p> <p>Guyana – Five large scale foreign-owned companies producing mainly for export markets</p> <p>Honduras – Foreigners hold 20% of capital in primary forest industry and 40% of secondary forest industry</p> <p>Suriname – Six concessions with a total area of 700,000 ha issued to foreign companies, mostly Chinese</p>

Source: ITTO (2002)

But North-South investment has played and continues to play an important role and is more widespread than for the pulp and paper sector.

Foreign investment in solid wood enterprises in tropical regions has been substantial as shown in Box 4.2. European companies have been investing in forest operations in Africa for decades while Asian companies have had significant foreign investments in the forestry sector since the 1960s but primarily within Asia. They have however, intensified their foreign investments since the 1990s and moved into other regions, notably South America and Africa (Sizer and Plouvier 2000).

More recent moves by European companies are into Eastern Europe, for example Danzer Group is closing veneer production in Germany and Belgium and building a new veneer mill in Prague. There are also signs of divestment from Africa because of the uncertain investment climate and declining profitability. In Ghana, new FDI into the forest sector is declining and this is thought to be primarily because of the shortage of raw materials (Amponsah 2003).

4.4.5 The Relation Between Industrial Structure and Trade

The preceding section has shown a clear trend towards increasing transnational involvement in the forest products sector and a more mixed picture in relation to market structure. While there are signs of increasing concentration in the pulp and paper sector, solid wood industries, in tropical regions particularly are fragmented, except in the more capital-intensive activities. It is important to examine how these trends in the structure of the forest products sector are linked, if at all, with changes in trade patterns and trade policy and what the implications are for future trends.

The Impact of Trade Liberalisation on Market Structure

The expansion of trade and the opening up of markets through trade liberalisation, has been an important driver of the process of consolidation and of mergers and acquisitions across national boundaries. This is because in order to compete on the global market, companies have to search for ways to maintain competitiveness. They can lower costs of production through exploiting economies of scale and scope, implying consolidation, or by shifting certain stages of the production process, in particular timber harvesting to low-cost locations, implying foreign direct investment. The increasing interest on the part of North American and European companies in fast-growing plantations in developing countries reflects this continuous quest to reduce costs of production in relation to competitors.

While trade liberalisation can be linked with increasing concentration, this does not necessarily imply increasing market power for the larger companies in the sector. The opening up to international competition changes the dynamics of industry restructuring and leads to a wider range of competitors.

The Impact of Trade Restrictions on Industrial Structure

Trade restrictions, in particular the log export bans in South East Asia, have also played a role in prompting wood processing companies in search of raw materials to invest in logging operations in other regions (Sizer and Plouvier 1998). They have also encouraged vertical integration from logging to processing as in the Philippines (Box 4.3). High import tariffs for processed products also stimulate foreign direct investment as a means for companies to produce behind protective barriers.

Whether FDI increases or reduces trade depends on the primary motivations behind it. These can include access to markets in the host country particularly where there are tariff barriers, access to resources and achievement of cost savings often through use of lower cost labour. Market-seeking FDI can sometimes have a trade-reducing or trade-diverting effect by giving companies direct access to the market in the host country. Norske Skog's investments in South America, for example, are motivated by the growing market for newsprint there. The company is now the largest supplier of newsprint in the region (Norske Skog).

Similarly, investments planned by paper companies UPM-Kymmene and Oji Paper in China are based on projections of substantial market demand there (Paperloop 2003). But these types of market-seeking investments appear to be less common in the forest products sector, than resource or efficiency-seeking investments.

Box 4.3 The Structure of the Forest Products Industry in the Philippines

In the Philippines, there has been a striking fall in the number of enterprises engaged in logging and other forestry activities from 45 in 1988 to 9 in 1997. At the same time there has been a drastic decline in timber output from a peak of 72.5 cu m in 1965-1969 to 18.10 in 1985-1989 and only 3.5 cu m in 1996-2000, less than 25% of wood processing capacity.. This has not been accompanied by an increase in size in terms of employees or value added implying that companies have exited the sector rather than merged (Medalla 2003). It has been the dramatic decline in forest resources which has led to this industry restructuring (although the depletion of forest resources was stimulated by the export trade). Trade policy has also been a contributing factor as the log export ban imposed in 1989 must also have affected the prospects for logging companies. Most if not all of the companies remaining in logging are vertically integrated and those that were not have closed down. However, the wood-based manufacturing sector in the Philippines has continued to grow in spite of the declining forest resources although there has been a decrease in the number of operating sawmills and plywood factories in the last five years (ITTO 2002). Trade liberalisation policies, in particular the reduction of tariffs on imports of intermediate wood products have been the main driving factor of the increasing wood-based manufacturing sector. The Philippines was the fourth largest importer of tropical veneer in 2001 and the 11th largest importer of tropical logs (ITTO 2003).

The situation varies, particularly for temperate regions. This is illustrated by a study of FDI and exports from forest companies in Finland, Sweden, and the US in the 1990s (Uusivuori and Laaksonen-Craig 2001). This found that FDI for the Finnish and Swedish forest industries had no significant impact on exports and that increasing exports were linked with decreases in FDI. For the US, a two-way negative feedback relationship between exports and FDI was found. Both sets of results imply that FDI and exports in the forest products sector may be substitutes rather than complements for the home country. But this says nothing about the trends in trade in the host country and while exports from the home country may decline as a result of FDI, at a global level trade may increase.

For tropical timber, foreign direct investment appears to have been primarily a driver of trade, facilitating access to forest resources in host countries, to supply home country markets as well as other markets. Exports of logs from West and Central Africa have been driven by the investment of European companies there and latterly Asian companies.

In some countries though, resource-seeking FDI has not had such a clear impact on trade. In Brazil, while foreign invested companies are mostly targeting export markets, they are outnumbered by Brazilian-owned exporting companies which account for 75% of wood exports (Young and Prochnik 2003). Moreover, very few of these foreign investments have involved greenfield investment. In most cases, an existing Brazilian company has been acquired which may well have been export-oriented already. In the Philippines, foreign investment in the forest products sector is also not very significant. In this case, this reflects the fact that the sector remained restricted for foreign investment for a number of years until 1992 when foreign equity of up to 40% was permitted for forestry and all restrictions were lifted for wood processing (Medalla 2003). By that time, there were little forest resources left to attract foreign investors.

In the pulp and paper sector, which is relatively capital intensive, foreign direct investment has potentially more significance in promoting trade expansion. Export-oriented plantation developments in South America, Brazil, particularly, currently involve significant amounts of foreign participation. But as with the solid wood sector, for some of the companies concerned foreign investment has come only after they were well-established. The driving factor for the establishment of these companies were government fiscal incentives provided in the 1970s and 80s and finance provided by the Brazilian development bank (BNDES). Moreover, FDI is constantly changing and an increase in foreign participation in one company may be accompanied by a reduction in another. While Cenibra, originally a Japanese and Brazilian joint venture has become 100% Japanese owned, Aracruz has increased its Brazilian participation – the 28%

share previously held by Anglo-American's Mondi group was bought in 2001 by the Brazilian company Votorantim.

The Impact of Increasing Market Concentration

As processing companies increase their market share through expansion and horizontal integration, they may increase their buying power in dealing with suppliers, particularly of wood raw materials. This means that they may be able to exert pressure on their suppliers for improvements in forest management. At the same time they may be able to capture any market benefits in the form of price premiums for certified products or access to higher value markets and ensure that it is their suppliers that incur the additional costs. There is an increasing concern that the producers closest to the resource and with the most scope for improvement in forest management are receiving little benefit from the demands of environmentally sensitive markets. Instead, the benefits are being captured by companies further down the value chain, which can exert their buyer power over these suppliers. There is insufficient evidence to confirm that this is happening on a large scale, but there appears to be a reluctance among the buyers groups for certified forest products to pay a premium. The general impression is that price premiums for certified products have not been as evident as originally foreseen. This may reflect the exercise of buyer power along the production chain or it may be attributable to an unwillingness or inability to pass on costs to the next stage of the production chain and ultimately to consumers.

Processing companies as they increase in size may also be able to increase their selling power in relation to retailers, end-users and ultimately consumers. Greater selling power may mean that processing companies can resist calls from their buyers for improvements in forest management or pass on some of the costs to them. The preceding analysis however, has shown that the processing stage of the forest products sector is not very concentrated in comparison to other sectors. This applies less to the pulp and paper sector than to the solid woods sector but this accounts for only a small part of overall wood raw materials used in production. Nevertheless, concentration ratios appear to be higher in developing countries and barriers to entry high because of restrictions on access to forest concessions.

Increases in the size of companies can affect their bargaining power with governments as they become more crucial for employment and government revenue. This may influence the terms on which they access forest concessions and increase the scope for discretion in the enforcement of forest policy.

Alternatively, the unit costs for government agencies of monitoring larger companies are generally lower making them the most likely target of government inspection activity. In the state of Amazonas in Brazil, where there are just a few relatively large mostly foreign-owned companies engaged in timber harvesting and processing, government regulation has been considered more effective than in other states. This was cited by one of the companies, Gethal as a contributing factor to its drive to seek forest certification (Bass *et al* 2001). Moreover, large companies are generally more visible to the general public, facilitating NGO campaigns.

The establishment of large companies in natural forests may increase market concentration but there may be beneficial effects in relation to sustainable forest management. In Brazil, where one of the main threats to the forest resource is conversion, many of the small forest companies survive by being able to migrate easily to new frontier areas. For large companies, high fixed costs reduce their scope for migration and this can encourage forest management practices in order to continue their activities in the future (Young and Prochnik 2003). Similarly in the case of Ghana, it is found that large-scale wood processing firms have a higher recovery rate than small-scale companies, implying more efficient use of the forest resource. They are also more likely to be able to diversify their range of products and processes again permitting higher recovery through use of mill waste as inputs for other products (Amponsah 2003).

Another consequence of increasing size of companies (though this does not necessarily imply concentration) is that they are more likely to secure financial backing through listing on a stock exchange. This could bring them to the attention of socially responsible portfolio investment institutions which provide another source of pressure for improvements in sustainable forest management as discussed in Chapter 4. Most of the large pulp and paper and integrated forest companies are listed with shares increasingly held by financial institutions. Solid wood companies, particularly those engaged in tropical hardwood processing, are more likely to be family-owned, private companies or at least family-controlled in the case of listed companies (van Gelder 1998).

4.4.6 The Impact of Vertical Integration on Forest Management

Trends to vertical integration, particularly to distribution and buying sectors may have the effect of simplifying the production chain and making the company at the forest operation level more visible to consumers. In environmentally sensitive markets this may intensify pressures for improvement in forest management and give a stimulus to forest and chain of custody certification. However, there are few examples of this happening, and in some cases companies have been able to keep a low profile even where they produce items sold at retail level. Stationery products originating from Asia Pulp and Paper, allegedly from unauthorised natural forest clearance in Indonesia, were sold through British retail outlets under other brand names and were not easily associated with the company (FoE 2000). What appears to be more important than forwards vertical integration in driving demand for certified products is the interest of key buyers with a position of leverage over their supply chain (Bass *et al* 2001).

Rather the pressure from end-users and consumers for SFM has led some wood product manufacturing companies to integrate backwards and increase their control over their sources of wood raw materials. An example is given by Tramontina a producer of wooden kitchen utensils and garden furniture in Brazil which having had little success in persuading its suppliers to change their practices, has bought forest land in order to apply for forest certification (Viana *et al* 2002). Similarly, Castle Doors, a US company with a manufacturing subsidiary in Bolivia, and a supplier of Home Depot, has stated plans to move into lumber production by acquiring forest concessions from the Government of Bolivia in order to achieve 100% certification of its products. Other advantages for the company of such backwards vertical integration would also be price and availability control (Castillo 2001).

In Brazil there is concern over the social implications of land acquisition by forest companies. Social tensions can be created by concentrated land ownership and large landowners or are a common target for invasions. The need to finance land purchase may divert resources away from the modernisation of production and the capacity to invest in sustainable management and improved labour conditions (Young and Prochnik 2003).

Increasing foreign involvement can have both positive and negative impacts on forest management and the outcome can vary depending on the business strategy of the investing company, its sources of finance, the markets it is targeting and the policy context in which it operates.

Foreign direct investment may bring improvements if the investing company has a global set of environmental and social standards and a declared policy on sustainable forest management and is concerned about maintaining its reputation. Most of the leading pulp and paper companies have policies or declarations on their commitment to sustainable forestry available on their websites and some solid wood companies also, for example Danzer Group. Shell had a policy of sustainable forest management for its plantations divisions and obtained FSC certification in 2001 for all its forest operations in South America (Shell 2001).

Some analyses of post-liberalisation natural resource-based companies in Africa also point to positive effects of FDI. They note that prior to economic liberalisation in a number of African countries, state controls in authoritarian political regimes suppressed competition and blocked the entry of TNCs, allowing natural resource wealth to be exploited by corrupt national elites. Subsequent to economic liberalisation, TNCs have generally held themselves accountable to higher environmental standards than those established by host governments, basically due to fear of eviction (Reed 2002).

Transfer of technology and skills may improve harvesting techniques and increase processing efficiency and so increase the viability of SFM. Moreover, there may be spillover effects on the forest management of small and medium companies that are linked with foreign-owned companies as suppliers. Gethal, a plywood producer in Brazil with majority US capital, is actively encouraging its suppliers to improve their forest management practices and to seek certification (May and Veiga Neto 2000).

Foreign investors may facilitate access to markets in their home countries or regions and so may bring contact with environmentally sensitive consumers. The implications of this depend on the size of these markets. In Brazil, in the tropical timber sector, certification is more common amongst foreign-owned companies than locally owned companies and the general impression is that FDI is connected to the development of a “modern” logging sector which could be more sensitive to environmental concerns expressed in foreign markets (Young and Prochnik 2003).

One implication is that the companies that are concerned about their reputation in environmentally sensitive markets may shift their investments away from natural forests in the tropics to plantations where requirements for certification can be more easily met without compromising commercial viability and competitiveness. Alternatively, they may shift out of tropical regions altogether. The shift of European companies away from Africa is said to reflect these concerns although issues of political risk and commercial viability are also involved. Issues around forestry TNC investment in some countries can be very sensitive. In Brazil for example, the mere threat of an influx of foreign capital contributed to a raised profile of the illegal logging issue in the country and stimulated an increase in attempts to improve regulatory capacity.

On the negative side it can be argued that the prime interest of some investing companies is to secure raw materials and labour at low cost, making forest mining without any consideration to long-term management the most financially rational strategy for them. International forest product markets do not penalise bad governance or corruption, in contrast to other environmental and manufacturing sectors (Ross 2001). Second, the transition economy literature shows that *inferior* quality foreign companies are attracted by lax environmental standards (Transition Newsletter 2000); less scrupulous TNCs are more likely than their domestic counterparts to be involved in state capture or public procurement kickbacks (Hellman *et al* 2002). While there are some examples of responsible forestry TNCs, there is a large literature on the abuses of TNCs in countries where forest governance is weak (Box 4.4).

Box 4.4 Trans-national companies and the race to the bottom

The literature, stemming mostly from international NGOs, is rich in examples of aggressive TNCs the move systematically from one country to another, relocating where environmental regulations are weakest – the so-called ‘race to the bottom’.⁵¹ One of the more authoritative studies was by the World Resources Institute and WWF (Sizer & Plouvier 1998). This study highlights differences between ‘new’ and older TNC forestry investments. It found that newer TNC operations tend not to invest in processing since export logging is more profitable; a high mobility of capital, with equipment rapidly moved from one country to another to take advantage of higher profitability; and frequent use of their own expatriate as opposed to local labour. The study observed that “the new investments have been concentrated in countries with generally weak or outdated environmental and social laws and little enforcement capacity”, for example, Papua New Guinea, Solomon Islands, Guyana, Suriname, Cameroon, Gabon and Equatorial Guinea. These countries are characterised by poor monitoring capacity, inefficient tax collection, lack of auditing capacity, and widespread administrative irregularities.

A notorious case has been that of Rimbunan Hijau in Papua New Guinea (PNG). This company has controlled about 40-50% of PNG’s log export trade through the 1990s by means of a Sino-Malaysian cartel involving several clusters of companies, each cluster containing foreign exporters and national, mainly ‘local landowner’, companies (Filer 1998). These companies were connected through mutual shareholdings, overlapping directorships, and shared office facilities. In 1993, PNG’s forest minister complained that Rimbunan Hijau was using its connections to block the implementation of the National Forestry Development Guidelines, at the same time as financing a new daily national newspaper to curry public favour. For Filer (1998), this cartel is the main obstacle to ‘rationalisation’ of forest management in PNG. He also points out that, unlike foreign mining and oil companies from North America, Europe and Australia, Malaysian timber export companies have not been subject to country of origin environmental pressure groups.

The problem of aggressive TNCs is by no means restricted to tropical or developing countries. For example, EIA (1996) reports how timber companies opposed stricter environmental regulations in Alaska, lobbying against protected areas for boreal forests. There have been clashes with indigenous populations and their property rights in such countries as Australia, New Zealand, Alaska and Lapland, the latter case involving old growth forests valuable to the Sami people for reindeer grazing (Dudley *et al* 1995).

⁵¹ International NGOs that have studied forestry TNCs include: Forest Monitor (2001), the Environmental Investigation Agency (EIA, 1996 and EIA and Telepak, 2001), Greenpeace (2001), Global Witness (2001), WWF (2002), Friends of the Earth (Glastra, 1999), and FERN (2001)

Hellman *et al* (2002) found that TNCs with local partners are more likely to engage in state capture, while TNCs with an overseas headquarters are less likely to do so. However the latter are more likely to use public procurement kickback payments to secure contracts. The evidence from international NGO analyses of TNC behaviour also suggests that in some cases governments purposely encourage less responsible TNCs. For example, low forestry taxes, weak monitoring and enforcement capacity, and corruption in concession allocation in Congo-Brazzaville have resulted in foreign logging companies controlling most of the concessions; such policies have allowed a subsidiary of the giant Malaysian company Rimbunan Hijau to gain control over most of the commercial forest in Equatorial Guinea (Forests Monitor 2001). Stricter domestic conservation laws can also encourage TNCs to relocate where effective regulation is weaker. For example, Stone Corporation admitted that it operated mainly in Latin America to avoid stricter rules in the US (Dudley *et al* 1995).

As foreign investment decisions are often heavily dependent on the availability of finance, the interest in sustainable forest management of the financial institutions can be important. The involvement of official finance institutions, multilateral and bilateral development finance institutions such as IFC and FMO of the Netherlands and export credit agencies should in theory provide scope for looking beyond financial returns to questions such as social and environmental and overall development impact. In practice export credit agencies and to a lesser extent DFIs, have been heavily criticised for their involvement in some controversial forest investments, notably Asia Pulp and Paper in Indonesia (Barr). Both types of agency have been taking steps to adopt more comprehensive ways of assessing their investments in order to address environmental and social issues. But CDC, which was one of the first bilaterals DFIs to develop and monitor ethical principles for investment and which in the past had an extensive forestry portfolio, decided to move out of forestry because of its low returns in relation to other sectors.

IFC has taken environmental issues more seriously than other agencies, and has safeguard policies on forestry and a range of other issues. Its involvement in the forestry sector aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. The effect of its policy though has been to limit its investments in natural forest management. Between 1992 and 1998, 64% of its total forest-related investment involved plantations and 36% boreal/temperate forest (IFC 2000). There were no investments in tropical forests as IFC's safeguard policy in operation from 1991 restricts the financing of commercial logging operations or the purchase of logging equipment for use in primary tropical moist forest (IFC 2002). The IFC along with a number of leading banks engaged in project finance has recently signed up to the Equator principles. Signatories to the principles seek to ensure that the projects financed are developed in a manner that is socially responsible and reflect sound environmental management practices. The IFC environmental and social screening process and safeguard policies are being used by signatories as a basis for their project review. While this is a progressive step, there is still the possibility that the provisions of the safeguard policies will discourage investment in natural forest in tropical regions.

The involvement of private financial institutions that specialise in socially responsible investment or that have a particular interest in forest management also provides scope for influencing the performance and attitudes of the company. In the case of the Brazilian plywood manufacturer, Gethal, forest certification was one of the conditions required by the U.S. investment fund manager GMO which acquired a majority holding in the company in early 2000 (May and Veiga Neto 2000). Other timberland investors in the US, such as Hancocks are also investing outside of the US, but a prime consideration in choosing and assessing an investment location is political risk. Their preferred investment locations have been developed countries or middle income developing countries in Latin America. Africa, apart from South Africa has received little attention from them.

Foreign invested companies are also likely to attract the attention of socially responsible portfolio investors. For developing countries this is most likely to be indirectly through holdings in the parent company if it is listed as few SRI funds invest outside of developed countries. Emerging market funds that invest in developing country companies directly have not typically taken much interest in environmental and social issues related to their investments but there are signs of change.

4.4.7 Conclusions

Market concentration is difficult to establish with any clarity because of issues related to definition of product categories and markets. There is increasing concentration in some parts of the forest products sector, pulp and paper particularly. However, in spite of the substantial publicity that mergers and acquisitions in the forest products sector have received, the sector is not as concentrated as other industrial sectors. The sector is very heterogeneous though, and for certain product categories such as newsprint and engineered wood products, concentration is more evident.

It is also difficult to assess the implications of changing market concentration for market power. In a globalising market, where production is increasingly destined for export or where imports are readily available, shares of national production are of less concern. Those product categories that do appear to be consolidating at a global level are also the ones faced by consolidation in buying sectors. This applies particularly to the pulp and paper sector.

However, an emerging trend is for processing companies to divest part of their own landholdings and to rely more on outside suppliers for their wood raw materials. This applies to both temperate and tropical regions. This means that the nature of contractual relationships between these suppliers, whether private landowners, outgrowers, or communities will be a determining factor in the attention given to sustainable forest management and in the division of the market benefits from it. The increase in forest landholdings by Timber Investment Management Organisations may be positive for sustainable forest management because of the interest of these organisations in holding forests as a long-term asset.

The solid woods industry is fragmented particularly in tropical regions and so to a great extent are its buying sectors. There may be a case that consolidation would be beneficial rationalisation rather than a sign of increasing market power. Arguably, a process of consolidation leading to modernisation of the industry could have beneficial effects on forest management. It would relieve problems of over-capacity, which is affecting profitability and also putting more pressure on forest resources.

Foreign direct investment in the sector appears to be increasing but its importance varies from country to country. In some countries such as the Philippines it has not played a major role, either in the development of the industry or in the depletion of forest resources. The impacts of foreign direct investment on forest management are very country and company specific. In Brazil and Ghana, some of the foreign invested companies are associated with progressive policies in relation to sustainable forest management and efficient use of raw materials. But numerous cases of bad practice worldwide on the part of TNCs have been reported, particularly in countries with weak governance and enforcement capacity.

High political risk in some tropical countries discourages investment by responsible companies with a long-term perspective and an interest in forest management. More attention needs to be given to overcoming these problems of risk. This is the role of development finance institutions and investment insurance agencies, which for investments in other sectors have provided a buffer against these risks. However, they have avoided investment in natural forests in tropical regions. They need to move to a more positive approach which would favour companies that can demonstrate sustainable forest management and promotion of local livelihoods.

4.5 Investments and Capital Movements in the Forestry Sector

By definition sustainable forest management is self-financing. Additional external financing could, however, be justified to cover the incremental costs incurred by forestry operators adopting sustainable practices, to create value for non-market benefits and to counteract those structural incentives that promote unsustainable practices. In many parts of the world unsustainable practices have caused great damage. To reverse these damages and establish SFM on a permanent basis considerable technical and financial input is needed.

There is a lack of common understanding on financial requirements for a worldwide implementation of SFM. The estimates of the financial requirements in themselves are rare and/or likely outdated. An assessment, which is often quoted, was conducted during the UNCED process. It stated that US \$31.25 billion would be needed annually for sustainable forest management implemented worldwide. ODA was

supposed to contribute 18 per cent of it, some \$5.67 billion. A few years later, the total figure was revised up to \$33 billion per year⁵². Capital equipment and infrastructure was supposed to take 37 per cent, protection of forest services 18.5 per cent and institutional development and capacity building 17 per cent of the total⁵³.

Those figures have been criticized for neglecting compensation for deforestation and forest degradation. Thus, adding the associated disinvestments, the total required financing should in fact amount to \$69.3 billion per year. However, this figure has not been without criticism either. In any case, the calculations refer only up to the year 2000 and thus they are probably of limited usefulness to today's policymakers.

Structure of Forestry Financing

Detailed, accurate data on financing of SFM is nonexistent. The figures that are available only refer to the forest sector in general. However, it can still be analysed to reveal the structure and trends of financial flows. There have been attempts to build a picture of financial flows based on secondary sources. One example⁵⁴ refers to the year 1993, when, according to a FAO estimate⁵⁵, ODA channelled to forestry was \$1.54 billion, 7.5 per cent of the total forestry financing. Private domestic and foreign contribution was approximated to amount to \$8-10 billion, consisting largely of investments in plantations and in processing industry⁵⁶. These figures suggest that some \$10 billion of public domestic investments was directed to the forestry sector.

ODA flows are better documented than the other sources of financing in the forestry sector. Estimates suggest that official flows increased in late 1980s and early 1990s from \$1.073 billion, to around \$2.2 billion (in 1996 US\$) in 1990 and 1992. Since then, up to 1997, to which the data extends, there has been a downward trend. In 1996, forestry ODA was \$1.3 billion⁵⁷.

Financing for SFM in the Context of Development Financing

Fresh data on financing of SFM is scattered and incomplete at its best. However, to be meaningful, any financing strategy for SFM needs to give due consideration to the financial environment that it will operate in. Sustainable forest management may have its own challenges but requirements in forestry financing may not deviate from the general trend in development financing.

Financial flows to developing countries have experienced well-known changes in the recent decade. The year 1998 was the turning point in capital flows and saw a new era in development finance. Three main developments shaping external financing are decreasing debt stock and increasing private flows, mainly FDI. ODA flows on the other hand are declining overall, and focuses of the contributing donors are changing. For example, in Africa between 1990 and 2000, official flows to agriculture, forestry and fishing decreased by more than half. At the same time, ODA in education rose by 400 per cent, reflecting the changing strategies and priorities in development financing⁵⁸.

The drop in the debt-equity ratio demonstrates that the stock of external debt has fallen while the stock of equity capital owned and controlled by foreigners has risen (Table 1 and 3). The debt-equity ratio for developing countries as a group dropped from 316 per cent in 1997 to 196 per cent in 2001⁵⁹, however, hiding significant variations from country to country. South Asia has the highest amount of debt relative to equity, having a debt stock six times higher than equities. Sub-Saharan Africa and Europe and Central Asia had a ratio around 300 per cent, while Middle East and North Africa approached 400 per cent in

⁵² Workshop on Financial Mechanisms and Sources of Finance for Sustainable Forestry. Pretoria, June 1996

⁵³ Chandrasekharan, C. 1996. Status of financing for sustainable forestry management programmes. In: Proceedings of the Workshop on Financial Mechanisms and Sources of Finance for Sustainable Forestry. Pretoria, June 1996.

⁵⁴ Moura Costa, P., Salmi, J., Simula, M. and Wilson, C. 1999. Financial mechanisms for sustainable forestry. UNDP, Programme on Forests, Working Draft.

⁵⁵ FAO. 1995. Forest Resources Assessment 1990. Global Synthesis. FAO Forestry Paper 124, FAO, Rome.

⁵⁶ Chandrasekharan, C. 1997. International cooperation and resource mobilization for sustainable forestry development. Proceedings of the XI World Forestry Congress. Volume 5. pp. 365-387. Antalya, Turkey.

⁵⁷ Madhvani, A. 1999. An assessment of data on ODA financial flows in the forest sector. UNDP, New York.

⁵⁸ UNECA. 2003. Economic Report on Africa 2003. Addis Ababa, Ethiopia.

⁵⁹ World Bank. 2003. Global development Finance. Striving for Stability in Development Finance. Washington, DC, USA.

2001. The lowest share of debt relative to external equity was in East Asia and the Pacific, 134 per cent, to a large extent due to China, where external-debt equity ratio was below 50 per cent.

This implicates a highly skewed distribution of FDI (Table 2). Worldwide, the top five countries received 45 per cent of global FDI inflows in 2001⁶⁰ while the share of developing countries altogether was 28 per cent. In absolute terms the rising trend of FDI, both in developed and developing countries has been rather strong. A closer look at the UNCTAD statistics on FDI inflows suggests, however, that the increase in the share of developing countries has not been steady. The annual average during 1990-1995 was 33 per cent, rising up to 40 per cent in 1996 and 1997, and then declining to 16 per cent in 2000. However, a positive development in 2001 was that the share of developing countries increased to 28 per cent when the world inflows of FDI declined by half.

Among the developing countries there are winners and losers. The top three recipients attracted 53 per cent of the net inward foreign direct investment in 2001 (Global development finance 2003). While some countries have been quite successful in attracting FDI, the share of LDCs of FDI in developing countries has declined, from an annual average of 2.3 per cent in 1986-1990 to 1.8 per cent in 1996-2000⁶¹. There was also diversity among LDCs, as 16 of LDCs received more capital inflows relative to gross fixed capital formation than an average developing country in 1998-2000. Nonetheless, at the global level the share of LDCs of total world FDI flows has remained below one per cent⁶²

Differences in the Structure of Financing between Developing Countries

The aggregate financial figures hide significant variation from country to country and do not reveal the critical differences in the dependency on different sources of financing. In absolute and relative terms Latin America and the Caribbean perform well in attracting foreign investments. They received 40 per cent of the net inward FDI flowing into developing countries in 2001, while they contributed 31 per cent to the total GDP of the developing world. They also hold one third of the total external debt of developing countries. On the other hand, the Middle East and North Africa received 3 per cent of the net inward FDI while contributing 8 per cent to the developing world's GDP.

In spite of the increasing role of private equity in development financing, dependence on official flows is still intense, especially in South Asia and Sub-Saharan Africa. While the share of private equity in developing countries as a group, exceeded ODA by three times, the ratio of private flows to ODA was about 50 per cent in South Asia. In Sub-Saharan Africa a stunning 90 per cent of external financial flows came from ODA.

⁶⁰ UNCTAD. 2002a. World Investment Report. Geneva, Switzerland.

⁶¹ UNCTAD 2002b. FDI in least developed countries at a glance. Geneva, Switzerland.

⁶² UNCTAD. 2001. FDI in least developed countries at a glance. Geneva, Switzerland.

Table 4.9 Selected indicators of external financing in developing countries in 2001, billion US\$⁶³.

	Net inward FDI	Net debt flows	Net private flows	Net official flows
East Asia and Pacific	48.9	-12.0	36.4	5.7
Europe and Central Asia	30.1	3.3	30.9	10.2
Latin America and the Caribbean	69.3	11.4	62.8	23.4
Middle East and North Africa	5.5	1.7	8.3	2.0
South Asia	4.1	-0.3	2.9	6.0
Sub-Saharan Africa	13.8	-1.0	11.6	10.2
All developing countries	171.7	3.2	152.8	57.5

Table 4.10 Percentage share of different regions of selected items in the developing world in 2001.

	Net ODA	Net inward FDI	Total external debt	GDP
East Asia and Pacific	13	28	22	28
Europe and Central Asia	18	18	21	17
Latin America and the Caribbean	10	40	33	31
Middle East and North Africa	8	3	9	8
South Asia	11	2	7	10
Sub-Saharan Africa	24	8	9	6
All developing countries	100	100	100	100

Table 4.11 External debt-equity ratios (per cent) and external liabilities (sum of total external debt and FDI liabilities as a percentage of 2001 GDP).

	Debt-equity ratio 1997	Debt-equity ratio 2001	External liabilities % of GDP in 2001
East Asia and Pacific	218	134	65.0
Europe and Central Asia	505	293	66.8
Latin America and the Caribbean	284	162	67.7
Middle East and North Africa	394	371	42.5
South Asia	968	613	30.5
Sub-Saharan Africa	515	303	90.6
All developing countries	316	196	61.7

Apparently, the higher the national income level, the higher the share and absolute quantity of private flows and lower ODA. In 2001, Sub-Saharan Africa received 24 per cent of the net ODA, an amount four times higher than their share of the total GDP of developing countries.

Significant changes have occurred in development financing as reflected in the case of LDCs, although mostly not at pronounced scales. In LDCs as a group, total ODA was significantly larger than FDI inflows, with total ODA three times higher than FDI inflows in the year 2000⁶⁴. Even though ODA remained the largest component of external finance in LDCs, its share declined, both in absolute and relative terms during the second half of the 1990s. The net ODA, bilateral and multilateral in total, declined from \$16.8 billion in 1990 to \$12.5 billion in 2000 (UNCTAD 2002). Interestingly, in 28 countries, where ODA decreased, FDI was on a rising trend. In only four countries was the trend opposite, showing increasing ODA and decreasing FDI. However, only in seven countries FDI inflow was more than ODA in 2000, demonstrating the crucial differences in the structure of external financial flows among LDCs, and by extension developing countries at large.

⁶³ World Bank. 2003. Global development Finance. Striving for Stability in Development Finance. Washington, DC, USA.

⁶⁴ UNCTAD 2002. FDI in least developed countries at a glance. Geneva, Switzerland.

4.6 Innovations in Timberland Investments – the Case of the USA

There are very significant changes occurring in the USA in forest and timberland investments that clearly have global implications. Less than twenty years ago financial timberland investors hardly existed. By 2002 financial timberland investors based in the USA held timberland assets valued at more than US\$ 11 billion and in the last ten years these investments have grown by 500%.

All this began to change about 15 years ago when some creative financial professionals, many of them people who had not specialized in forestry or forest product industries previously, began to realize, analyze and promote the attractiveness of timberland investments. As Best and Wayburn (2001) state, "Forestland has chiefly been a personal and industrial asset. It is now evolving into a financial asset, owned for its value as a portion of a diversified investment portfolio." The source of the investment is not, so far, retail or small scale investors, it is institutions that are investing very large amounts of money in a wide range of investments. These very large funds have full time teams of sophisticated experts who generally do not make direct investments but decide what kinds of funds and which fund manager they will invest in.

Timber Stumpage Markets and Prices

In addition to the steady increase of timber value per volume, if stumpage prices also increase in real terms then this adds another source of increment to returns on timberland investment. During the 20th century southern and northwestern United States softwood stumpage prices increased at about the same rate as the S & P 500 which measures. That is they increased about 10 times in real terms over 100 years. From 1990 to 2002 softwood stumpage prices in various US regions started in a range of US\$ 200 to 300, rose as much as 50% in the mid - 90s, and are currently about 10% higher than they were in 1990.

From the perspective of the long term investor, it appears clear that the trend for the last several decades (or even 100 years) is for stumpage prices of softwoods in the USA to increase significantly, at about the same rate as public equities. There are some similarities in the trends, but they also follow independent tracks. Returning to the point about complexity, there are in fact hundreds of different lumber and related products, each following its own pricing dynamic. For example, each region has its own hardwood commerce with distinct products, buyers and prices. They are sometimes related, such as when the northwest USA log market was severely constrained in the early 90s by environmental action and log prices in southeast Asia also skyrocketed.

The markets and prices that are most important for developing countries are the tropical hardwoods and, for the softwood plantation countries, the pulp and paper markets. The Asian hardwood market has developed to the point where it functions largely as a commodities market. African and Latin American hardwoods are largely traded in a specialties market, meaning that there are many brokers and small scale buyers (furniture and flooring manufacturers are common), and that quality and reliability are just as important as the generic type of lumber. As a general rule, in both industrialized and developing countries, the high quality hardwoods (for example cedro, cherry, Khaya, mahogany, oak, teak, walnut, etc.) attract a price that enables them to be shipped world-wide. Lesser quality or less known species do not at present. The fact that only 1 or 2 % of the volume of a tropical forest in Africa or Latin America can be harvested for an export product is a serious problem for sustainable management. But the much higher levels of commercially valuable species that are harvested in Asian forests have not led to sustainable management there, quite the contrary in most cases.

High quality tropical hardwoods can be the most valuable wood in the world. But generally the international prices of any but the highest quality pieces of the most valuable species are very low. This makes it very difficult for entrepreneurs in developing countries to succeed at sustainable forest management businesses, and underlines the importance of viable markets for environmental services.

Property Values

The timberland invested in is timber on the land, and that land has some property value. Independent of the quality of the forest the land value may be very low or it can be quite high. Investors point out that one can buy large tracts of roadless forest in the Amazon for the incredible price of US\$ 20/ha. On the other hand, forestland can become very valuable where it can be used for recreation or residences. Many

financial investors in the USA use these higher values of some of the timberland they acquire as an integral part of the investment returns.

The value of property is a double edged sword. On the one hand selling off a piece of timberland acquisition as residential plots can make an investment much more lucrative, in effect increasing the original price if the market is functioning rationally. On the other hand, where property values (and taxes) have escalated, as they have in many areas of most wealthy countries, the timber returns alone cannot justify the investment necessary to acquire the land. This has the potential to effectively remove production forestry from large areas. The whole topic relates closely to conservation easements which are discussed below.

Income and Capital Appreciation

Closely related to the above is that the returns reported include two major components, income (or EBITDDA) and appreciation (or capital). In the funds managed in the USA the income is fairly constant and averages 4 – 6 %. Appreciation, or capital value, is much more variable, going above 20% in some years and being negative in other years. Property or land values vary with economic factors that have little or no relation to timber markets. But, at least in the USA, when stumpage prices rise or fall, timberland property values reflect this. This part of the variation in property value is actually reflecting what investors think future timber prices will be.

Different Approaches

The different approaches taken by various financial timber investment organizations is indicative of their thinking and decision making systems. Some of these organizations focus on one region in the US. Some of them have holdings in all forestland regions. Some invest exclusively in plantations; some invest exclusively in natural forests; and some in both. At least one has mainly concentrated on southern hemisphere plantations. With a few exceptions, their approach is to invest in and hold the timberland but not to invest in harvesting or processing operations. In general therefore they do not invest in vertically integrated operations (timber production, processing and marketing). One can note that the traditional forest products companies do base their operations and investments on vertically integrated operations. These different approaches signify that, in this relatively new field of investment, those most informed and experienced differ in their opinions on where the optimum combination of high return and low risk may be found. Naturally once they have specialized, this tends to continue because their expertise in that specific area grows.

Some TIMOs are divisions of larger fiduciary companies like commercial banks and insurance companies, some are divisions of private investment companies, and others deal only in timberland investment. The major TIMOs and the amounts of timber assets they manage are summarized below in Box 4.5.

US Investments in the Southern Hemisphere

In the southern hemisphere below the Tropic of Capricorn only a few countries occupy a relatively small land mass: Argentina, Brazil, Chile, Uruguay, South Africa, Australia and New Zealand. Softwood plantations here are more productive than anywhere else in the world. Analysis shows average growth rates of 35 m³/ha/yr.

Box 4.5 Timberland Investment Management Organizations (TIMOs)

<p>Hancock Timber Resource Group 1.2 million ha US\$ 2.6 billion</p>	<p>Founded in 1985. Successful in attracting public funds. Moving towards vertical integration by offering in-house forest management. Mostly in USA (one int. property).</p>
<p>UBS Timber Investments 440,000 ha US\$ 1.2 billion</p>	<p>Founded in 1982 as the Boston Company Resource Investments (RII). Moving into Southern Hemisphere investments.</p>
<p>Forest Investment Associates US\$ 1.1 billion</p>	<p>A spin off from First Atlanta in 1982. An independent regional player in the southern USA.</p>
<p>Campbell Group 320,000 ha, US\$ 1.6 billion</p>	<p>A vertically integrated group in the northwest USA.</p>
<p>Wachovia Timberland Trust US\$ 900 million</p>	<p>The business was acquired with First Atlanta. A regional player in the southern USA.</p>
<p>Prudential Timber US\$ 500 million</p>	<p>Also focused on southern USA.</p>
<p>The Forestland Group 220,000 ha US\$ 700 million</p>	<p>Founded in 1995. Focused on hardwood forests in eastern USA.</p>
<p>Xylem Group US\$ 250 million</p>	<p>Invests in companies that own forests and processing facilities in the southern hemisphere. Prepared a Rain Forest Fund in 2000-01.</p>
<p>GMO Renewable Resources 280,000 ha US\$ 370 million</p>	<p>Founded in 1997 by RII principals and sponsored by Grantham, Mayo & Van Otterloo. Offers diversified funds, focusing on combining natural forests and plantations, both domestically and internationally.</p>

(Adapted from a GMO Briefing Paper)

This is more than triple the growth rate in the southern USA. That, and increasing global demand, has attracted international investment to all of these countries. And in all of them, but led by New Zealand, there is an active market in softwood plantation timberland where they can be bought and sold at any stage of their development.

Comparison of Timber Prices

Region	US\$ Hectare	MAI Growth m ³ /ha/year
Brazil	US\$1,280 to US\$2,200	40 to 60 (Eucalyptus)
Uruguay	US\$500 to US\$700	40 (Eucalyptus)
Argentina	US\$350 to US\$700	25 to 35 (Southern Yellow Pine)
Chile	US\$1,000 to US\$1500	25 (Radiata)
New Zealand	US\$1,200 to US\$1,650	25 (Radiata)
U.S South	US\$1,500 to US\$2,500	10 (Southern Yellow Pine)

Ha=hectare=2.471 acres

Source: Forest Tornagaleones S.A (A Xylem Portfolio Company)

Massive investment over the past twenty years has shifted the global timber supply picture. The emerging southern hemisphere plantations now supply about 500 million m³/yr., and this is projected to grow to one billion m³/yr. over the next 100 years when it will equal the supply from temperate forests.

However the price of New Zealand export *radiata* stumpage has fallen in the last ten years from a peak of over US\$ 400/ MBF to US\$ 170/MBF (see Figure 4). This has not been favorable for these investments, but it is consistent with economic theory that this inexpensive and relatively risk-free opportunity to produce fiber has resulted in investment, increased supply and reduced price.

There are several important points here. First, there is a zone within a handful of countries in the sub-tropical southern hemisphere which has attracted substantial international investment and almost certainly will continue to do so. This area is now and will increasingly become a major player in global fiber supply. Second, this is a specialized situation. The great majority of countries do not have plantation land with this potential, and they will not receive this kind of international investment. The development of these forests and the investment associated with them is positive for the countries and for the globe overall in that demanded fiber is supplied efficiently, but it does not have much of an effect on the provision of environmental or social services from the forests of the poor countries. It is possible that without these plantations some of the world's natural forests would be harvested for wood fiber. But it would seem much more probable that the absence of the southern plantations would result in increased utilization and investment in northern temperate and boreal softwood forests. The products of the tropical broadleaf forest, mostly fine hardwoods and fuelwood and environmental services (biodiversity, carbon sequestration) and social services (energy, agricultural land, food and medicine for the poor), are quite distinct from the fiber product of fast growing plantations.

Other than the southern hemisphere plantations, tropical plantation projects have attracted regional, but not global, private investment. There are only 3.6 million ha of plantations in Africa and 6 million ha in Latin America. Asia on the other hand has 42 million ha, 32 million of those in China, India and Japan. There are some areas of successful tropical hardwood plantations, notably teak in Costa Rica and Java. These again are fairly specialized situations. It would seem much more viable to manage tropical hardwood production through natural regeneration and extensive systems of management. This is very similar to the management systems now applied to northern temperate broadleaf (hardwood) forests, although the forest types are quite different. And those extensive, low investment, long cycle management systems have attracted significant investment in the USA. But, the key point is that natural forests in poor and middle income countries have not yet attracted any significant international investment for sustainable management purposes.

International Investment in SFM in Natural Forests in Developing Countries

Research for this report has encountered only three significant new international investments in sustainable management of natural tropical forests: the Precious Woods investment in the Amazon, the GMO investment in Gethal Plywood in the Amazon and the Candlewood Timber Group investment in northwest Argentina. There has also been a major initiative for a fund and a major investment in the temperate *Notofagus* forests of Southern Chile and Argentina which will be reviewed below. There are European investments in Africa and Asian investments in Asia. These investments have been occurring for many years or even decades. In many past instances they have not been sustainable, because of the two major issues reviewed at the beginning of this report. There may be some changes toward sustainability recently, but they have not been independently certified as yet, and would not therefore be eligible for World Bank financing.

Under current conditions, "mainstream" international financial forest investors are not even close to considering investments in natural forests in poor countries. First, when they venture outside of North America, they only invest in the seven southern hemisphere countries mentioned earlier where they perceive the country risk to be relatively low (and some will only invest in OECD countries). Second, even in those countries they only invest in plantations where land titles, yields, returns and prices are much clearer, and where environmental risks, ironically, are lower. It appears that international investment in sustainable natural forest management will not occur on a significant scale unless the system is fundamentally altered and new mechanisms are put in place. Nevertheless, there have been some pioneering attempts, after decades of international discussion, and these will be reviewed below.

The largest and most important initiative to date is the Precious Woods Company (PW). PW started in 1990 with investors based in Zurich and acquired abandoned pasture land in Costa Rica for plantations of teak and a few other valuable hardwoods. PW Costa Rica now owns 7950 hectares of former cattle ranches in that country of which 4600 ha have been planted with trees (3300 ha with teak). PW Costa Rica received FSC certification in 2002, and also marketed the first thinnings from plantations. Teak is one of the world's most valuable woods, and good quality lumber is very valuable. It is increasingly depleted in its native range in Asia. Teak grows well in Costa Rica because the latitude is similar to its native range, and in northwest Costa Rica there is adequate rainfall with a pronounced dry season. In other words teak has very specific site requirements and cannot be grown competitively throughout large areas of the tropics. In Costa Rica, through studies at CATIE and based on wide spread commercial plantation, there is increasingly good information on growth, yield and value. PW uses this information to calculate an estimated annual return on investment of 10 – 11 %, and to include in its consolidated balance sheets the value of biological assets in Costa Rica.

In 1994 PW Amazon acquired 80,000 ha of natural forest in the heart of the Brazilian Amazon near Itacoatiara, and in 2001 the company acquired another 42,000 ha in the same area. In March 2003 another 123,000 ha were purchased, "To ensure that the forested area will suffice in the long-term... to guarantee present harvesting volumes in the future." (This and subsequent quotations in this section are taken from the Precious Woods Annual Report 2002.) In 2001 PW Para acquired 45,700 ha of natural forest land in the Brazilian state of Para near the mouth of the Amazon River, and in 2002, 30,600 ha more was acquired. PW now owns 321,300 ha of natural forest in the Brazil Amazon. PW Amazon was first certified according to FSC standards in 1997 and since then has been audited and reviewed regularly.

Since regular stumpage markets in the Amazon are not established, and available processing facilities are generally of very poor quality, PW's only option was to establish its own processing facilities. This they have done, including the purchase of a vertical slice veneer mill from a Malaysian timber company that was leaving the area. Sliced veneer is by far the highest value added product for high quality fine tropical hardwoods. They also arrange transport of logs and sawn wood, and they have established their own marketing system in Europe and North America for their FSC certified products. In short, it is a fully integrated operation, and this has several significant implications.

It is striking that in the 2002 consolidated balance sheet the biological assets for Costa Rica are valued at US\$ 29 million while those of Brazil are valued at US\$ 12.5 million. This indicates that 198,000 ha of Amazon natural forest, at US\$ 63 per ha, were valued at less than half of 7950 ha in Costa Rica, 4600 ha of that planted, 3300 ha with teak. (The above is extracted from the Annual Report, the remainder of the paragraph is the author's speculation.) There are probably about 3,000,000 m³ of standing commercial timber on the 2002 Amazon properties, most of it harvestable, and annual commercial timber growth can be conservatively estimated at around 200,000 m³. Thus we have a valuation of about US\$ 4 per m³ of standing timber. The Costa Rica plantations contain about 60,000 m³ of growing timber which is conservatively valued at US\$ 405 per m³ for prime commercial logs. Teak is inherently more valuable than the average for the fine hardwoods of the Amazon, but it is perhaps double or triple their value, not 100 times the value. The difference lies in: the security of ranch land title in Costa Rica compared to the security of forest land title in the Brazil Amazon; the fact that a stumpage market for teak and other plantations exists in Costa Rica so that the timberland owner may make direct sales; and conversely that one must assume all the risks of managing an integrated operation in the Amazon as well as the costs of developing harvesting access which is already provided in the plantations. However this low valuation also represents a tremendous investment opportunity. If an enterprise can secure title, invest to create access and successfully manage an integrated operation, then the forest timber values are much closer to the US\$ 6300 per ha of Costa Rica than to the US\$ 25 per ha paid in the Amazon.

It is evident from the Company 2002 Annual Report, a remarkably open and informative document, that PW in the Amazon has been learning a lot of lessons as they have proceeded. First, it has been necessary to acquire much more forest land to achieve sustainable harvest levels sufficient for a profitable business. This is complemented by an executive committee in Switzerland which has provided steady leadership and the financial sophistication for successful relations with investors. For PW Amazon, "The original planning and set-up costs were significant. In 1997 US\$ 5.83 million of these intangible assets were written off as an extraordinary item. Additional expense was incurred to achieve the FSC certification." However by the time PW Para was set up in 2001, enough management knowledge had been acquired that a profit there was achieved in 2002, only the second year of operations.

PW net sales in 2002 were just over US\$ 9 million, and net profit was US\$ 2.16 million. Also in 2002, in perhaps its most significant financial achievement, PW successfully completed an IPO on the Swiss Stock Exchange. 180,000 shares were offered at CHF 60 per share. “Whereas the SWI (Swiss Performance Index) lost 40% from the middle of March 2002 to the beginning of March 2003 Precious Woods shares remained close to the issue price of CHF 60.” At the end of 2002 the share capital amounted to CHF 81,032,150 consisting of 1,620,643 shares.

It is clear that there has been significant effort and issues associated with land titles and land acquisitions. 48 families, including poor settlers and people with vacation homes, occupied PW Amazon’s land when it was acquired, and all have been given secure title, removing that area from PW holdings, as the land was already cleared. The report also states that the Para land transactions have been much more complicated than those in Amazonas state. (Para is more densely populated and developed compared to Amazonas, although these levels are still quite low compared to most of the world.) The company is waiting for legal clarification of “property rights” and “possession rights” prior to finalizing options for additional land purchase. Clearly there are significant legal expenses and risks involved.

Nothing in the PW Annual Report or other documentation contemplates sales of environmental services from their forests. However company management is clearly very aware and proud of the environmental and social benefits their enterprise is providing. For example, “Precious Woods’ main objective in Brazil: to succeed, as a commercial enterprise, in conserving the forests complex eco-system”; or, “The forest is managed using methods which imitate nature and maintain its biodiversity.”

A quote to reflect the message of the Annual Report:

“What does an investor acquire with 100 shares ?

- Over 18 ha of Amazon Forest which is then protected from deforestation
- 2850 m2 of reforestations in Costa Rica which absorb almost the same amount of CO2 that is released by a car traveling 20,000 km.”

There are three other major international investments in natural forests in South America that the author is aware of. Trillium is a family corporation that has been very successful in real estate and forestry investments in northwest North America. Based on their vision of the potential for sustainable management of natural forests, in 1993 they acquired 400,000 ha of forest land in southern Chile and Argentina. The natural forest there is a monoculture of Notofagus, southern hemisphere beech or lenga. The species can produce a very fine hardwood, similar to cherry. The vision was ambitious, “Trillium set out to create a world model of truly sustainable forestry and to provide environmental leadership through science and sustainability.” From the beginning the project followed a high profile strategy with announcements of land acquisitions, investments and job creation potential. In both Argentina and Chile, the project met significant environmental opposition. Necessary permits were delayed or denied. Trillium found it necessary to enter into extended dialogue with political leaders and community and environmental groups. In Chile the project’s harvesting and facility construction plans have been approved, and in Argentina they are still on hold. Significantly more than US \$ 100 million has been invested in the project, and there is little revenue so far, but Trillium management is positive and the possibility of success remains.

Another initiative is being implemented by the Candlewood Timber Group that purchased 100,000 ha of sub-tropical hardwood forest in northwest Argentina in 1998. Around US \$ 10 million has been invested in the project. The forest will be managed through natural regeneration, comprehensive inventories and carefully planned low impact harvesting, as is the case with other projects considered in this section. An FSC certification inspection took place in August 2003. Candlewood was started by a group of New York based investors and the former Dean of Yale’s School of Forestry who is the chair person of the company. This prominent and well financed group has had difficulty attracting all the capital necessary to completely fund the project. An IFC loan was well advanced until Argentina defaulted in January 2002, resulting in continuing lack of agreement with the IMF and suspension of World Bank loans.

The only other foray into South American natural forests by a US based financial investment group is the Gethal project in Amazonas, Brazil in which GMO of Boston invested in 1999.

The investment of US\$ 8 million purchased a majority of the company which owned 160,000 ha of hardwood forest and produced rotary peeled plywood from some of the softer species. The project was

FSC certified in October 2000. The New York based Rainforest Alliance published this description, “The right company, doing the right things, at the right time, and in the right place makes a difference in the tropical rainforest.” GMO has a very experienced team of timberland investors, and they are not pleased with the way this investment has gone so far. There have been serious problems with project management and factory management to date that may jeopardize the future of the project. It is worth noting that the experienced and talented GMO team participated in a number of international discussions, and actively sought public funds for some of the appropriate costs of the project that were clearly producing environmental and social benefits. So far they have encountered no source for this and no public funding for a public-private partnership.

A Rainforest Fund

One of the experienced TIMOs in the US is the Xylem Group. Their approach was significantly different than most others because they placed private equity internationally in existing forest enterprises, often ones with forests and processing facilities, where they took a majority position. Since its founding 1994 Xylem has raised and managed hundreds of millions of dollars. In 2001 and 2002 Xylem assembled an excellent team managed by its President to launch its Rainforest Fund. The Fund aimed to raise between US\$ 100 to 500 million. The Fund would invest in natural forest and plantation management projects in developing (rainforest) countries, and all projects would receive FSC certification. The Fund received the active public support of WWF and its Global Forests Trade Network. There is a comprehensive 86 page booklet that describes the rationale, justification and operational approach of the Fund. Without systematically summarizing all of its points, it may be said that it is articulate and well-informed and makes the most convincing case possible for this kind of a fund. It cites the return and risk information that was reviewed earlier to make the case for forest sector investment. It then presents the rationale for international timberland investments:

- enhanced returns relative to those available in domestic timberland investments, driven primarily by higher biological growth rates available offshore vs. onshore for similar species;
- attractive entry prices for the acquisition of either productive bare land or existing forests;
- capability to enter markets that are in either the initial pioneer stage or high growth stage of development;
- geographic and market diversification within the timber investment portfolio.

Followed by the rationale for tropical forest investments:

- global market demand for high value, tropical hardwoods increasingly exceeds supply. There is no short term solution to this growing imbalance;
- in natural tropical forests, low entry prices for valuable timber stands combined with the commercial knowledge and acumen required to release inherent asset values creates the potential for significant uplifts in book valuations;
- tropical plantations are more productive than temperate plantations, with growth rates up to 10 times higher than temperate plantations;
- tropical regions generally have lower production costs.

And they also made the argument that market demand and even price premiums were growing for independently certified products, and that certification would bring the support of major environmental groups. For balance, it should be said that the booklet also presents the possible risks of such investments, and that was generally consistent with the risks investors see that have been considered earlier.

Four highly experienced professionals worked full-time more than a year to attract investments to the Rainforest Fund without major success. The Fund was not closed in 2002, but work on it has been suspended.

5 International Regime on Trade and Environment

5.1 An Overview of the Regime

5.1.1 International Trade Regime

The international trade rules have been extensively reviewed in the literature in respect of the appropriateness of the disciplines and how they should be best applied in order to avoid unnecessary adverse effects. The following is a short description of the international trade regime and regional trade agreements impacting on forest products trade and markets for environmental services.

World Trade Organization (WTO)

The purpose of the Uruguay Round was to advance the liberalization of international trade. The issues related to technical barriers to trade, sanitary and phyto-sanitary measures, subsidies and intellectual property rights are discussed in Chapter 6. In this section the relevant provisions of the GATT 1947 and 1994 are summarized. The WTO agreement listed below have or could have specific implications for the conservation and sustainable use of forests:

- GATT General Agreement on Tariffs and Trade
- TBT Agreement on Technical Barriers to Trade
- SPS Agreement on the Application of Sanitary and Phyto-sanitary Measures
- TRIPS Agreement on Intellectual Property Rights
- Agreement on Implementation of Article VI (Anti-dumping)
- SCM Agreement on Subsidies and Countervailing Measures (Agriculture Agreement on Agriculture)
- GATS General Agreement on Trade in Services
- Agreement on Government Procurement
- TRIMS Agreement Trade Related Investment Measures

The need to consider environmental protection in the context of the international trade rules under the various agreements of General Agreement on Tariffs and Trade (GATT/WTO) has been recognized. The WTO Committee on Trade and Environment (CTE) has reviewed environmental issues related to products and their production and processing methods (PPMs) but no significant decisions have been made due to slow progress in this area. This is a sign of the lack of consensus between member countries on moving forward. In the area of forests, the CTE has, nevertheless, recognized environmental benefits arising from the removal of trade restrictions and distortions (WTO 1997). The core principles of General Agreement on Tariffs and Trade (GATT/WTO) are (i) non-discrimination, (ii) most favored nation (MFN), and (iii) national treatment (NT). The two latter ones can be called “liberalizing principles”. The MFN treatment, by construct, first applied to trading partners on bilateral basis, partners often agreeing on mutual concessions in terms of tariffs. WTO membership guarantees a permanent and unconditional MFN status.

The principle of national treatment means that an imported product, on entering the importing country, must be accorded treatment no less favourable than that accorded to the domestic product. NT includes three main elements:

- The imported product must not be subject to internal taxes or other internal charges in excess of those applied to a like domestic product.
- The imported product must be accorded treatment no less favorable than that accorded to a like domestic product in respect of rules and requirements relating to sale, purchase, transportation, distribution or use of the product.
- No member country can have a regulation laying down that in use of a product, a certain amount or percentage must be from domestic sources.

The MFN principle requires equal treatment between all WTO member nations, e.g. extending any trade preferences agreed by any two countries to all others (with some exceptions set forth in GATT 1947 Art.

I.2). Article XI prohibits quantitative restrictions on exports and imports of goods, except in certain very specific circumstances.

The WTO contains rules and jurisprudence on import restrictions based on both legality and environmental considerations. In addition, some of the instruments to combat illegal trade, such as verification of origin, certification and labeling, are under continuous discussion in the Committee on Trade and Environment, and Committee on Technical Barriers to Trade.

Article XX of GATT provides general exceptions applicable to all GATT obligations. One exception is for measures necessary to protect human, animal or plant life or health (Art. XX(b)). Other relevant exceptions are for measures relating to the conservation of exhaustible natural resources taken in conjunction with domestic restrictions (Art. XX(g)) or measures necessary to protect public moral (Art. XX(a)). However, none of these measures may constitute arbitrary or unjustifiable discrimination between countries or constitute a disguised restriction on international trade (Art. XX, Chapeau).

The objectives of the Technical Barriers to Trade (TBT) Agreement are (i) to ensure that technical regulations and standards are not used as disguised protectionist measures, and (ii) to reduce the extent to which technical regulations and standards operate as barriers to market access, primarily encouraging their harmonization. The main substantive provisions of the Agreement have been summarized below (TBT Agreement, Annex 3):

- In respect to standards, products originating from other WTO Member countries shall not be accorded treatment less favorable than like products of national origin.
- Standards and the process of their preparation shall not create an unnecessary obstacle to international trade.
- International standards shall be used if they exist and are relevant.
- National standardizing bodies shall participate in the preparation of international standards.
- The standardizing body in a Member country shall avoid duplication of or overlap with the work of other standardizing bodies in the national territory or of international or regional standardizing bodies.
- Every effort shall be made to achieve a national consensus on standards.
- The standardizing body shall specify standards based on product requirement in terms of performance rather than design or descriptive characteristics.
- At least every six months the standardizing body shall publish a work program on standards under preparation or adopted. The titles of specific draft standards shall, upon request, be provided in English, French and Spanish.
- Before adopting a standard, the standardizing body shall allow a period of at least 60 days for the submission of comments on the draft by interested parties.
- Upon request, the standardizing body shall promptly provide a copy of draft standard, which has submitted for comments.

TBT agreement sets out procedures to ensure that technical regulations and standards, including packaging, marking and labeling requirements, do not create “unnecessary obstacles to international trade”. The TBT seeks to ensure that product standards are not used as disguised protectionist measures, and to reduce the extent to which they act as barriers to market access.

The TBT Agreement deals with two types of possible barriers to trade: (1) Technical regulations refer to “product characteristics or their related processes and production methods, with which compliance is mandatory”. (2) A standard is “approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory”. As certification of forest management is usually a voluntary activity, the TBT provisions on standards would appear to be relevant.

Process and Production Methods (PPM) is about how a particular good is produced. The basic principle of GATT/WTO is that any product should be considered as such, without consideration of how it is made.

A core issue in the trade and environment debate concerns the treatment of measures, which place distinctions on products based on their processes and production methods, as compared to distinctions based on the quality of the product as such. Holistic environmental regulation, by definition, addresses the manner in which products are produced, thereby treating the same products differently. Often, countries introducing such PPM based measures on their own products look to treat imported products similarly, *inter alia*, to offset any negative competitiveness effects.

Sanitary and phyto-sanitary (SPS) measures are used to guarantee that the producer has been capable of cleaning, sanitizing, sterilizing or by other means to render the offered commodity free from unwanted dirt, seeds, pests or germs. Standards in relation to plant health are generally acknowledged as legitimate, since introduced pests and disease can have devastating effects on the health of domestic forests.

Protective measures of SPS type are regulated under the WTO Agreement on Sanitary and Phyto-sanitary Measures (SPS Agreement). The SPS Agreement states that such regulations should not become unnecessary barriers to trade. It requires that any sanitary or phyto-sanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, and is based on scientific principles and sufficient scientific evidence (Art. 2.2). Although there is a presumption in favor of using international standards, countries may take stricter measures if there is a scientific justification or as a result of a prescribed risk assessment (Article 3(5)).

Government purchases make a very important share of the total markets. Government expenditures make between 10 to 25% of the Gross Domestic Product (GDP) in OECD countries. The purchase decisions of governments are important from several viewpoints: (i) economic influences, (ii) environmental influences, and (iii) leverage impact on the rules and functioning of the market in general. The Plurilateral Government Procurement Agreement (GPA) is different from most WTO agreements in the sense that it is plurilateral, i.e. the countries that are WTO members do not automatically become members in this agreement. The GPA has around 30 signatories, mostly from OECD countries. The objective of GPA is to require that governments are fair and transparent in their tender bidding.

GPA is different from GATT in the sense that it does not rule against discrimination between similar products, but it rules against discrimination between foreign and domestic suppliers. GPA rules that technical specifications should be “based on international standards, where such exist, otherwise on national technical regulations, recognized national standards, or building codes.” A national technical regulation is any standard set by a recognized body. Thus it is likely that ISO 14001 Environmental Management System (EMS) as well as eco-label programs would be acceptable from the point of view of GPA.

Regional Agreements related to trade and the EU

The North American Free Trade Agreement (NAFTA) Article 104 lists seven international environmental agreements (IEAs), and agrees that they will surpass NAFTA in the case of disagreement. They include CITES which has direct relevance to tropical timber. The domestic laws resulting from the listed IEAs must be those “least inconsistent with the other provisions of NAFTA.” So a party would have to show that a challenged measure could not have been somehow ‘better’, or more consistent with NAFTA. But the more NAFTA-consistent alternative does not need to be politically or economically feasible.

There are eight member countries in the Association of South East Asian Nations (ASEAN). They are Malaysia, Indonesia, Philippines, Singapore, Thailand, Brunei, Vietnam and Myanmar. As one means to step up the intra ASEAN trade, a Common Effective Preferential Tariff (CEPT) scheme was initiated in 1992. The objective was to arrive at an ASEAN Free Trade Area (AFTA) in the year 2008.

Initiated in 1989, Asia-Pacific Economic Cooperation (APEC) initially comprised the then six ASEAN members, i.e. Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand and their six “official Pacific dialogue partners” namely Australia, Canada, Korea, Japan, New Zealand and the USA. Later, the membership was enlarged to include China, Hong Kong, Taiwan, Papua New Guinea, Mexico and Chile.

Under the Bogor Declaration signed in 1994, APEC agreed on a timetable for trade liberalization to commence in the year 2000 and be completed within ten years for the developed nations, 15 years for the newly industrialized countries, and 20 years for the developing nations. As APEC is committed to the

principle of “open regionalism”, trade concessions would be extended to non-members on a reciprocal basis.

In 1997, APEC economies agreed to include forest products among the nine sectors which would be liberalized as part of an Early Voluntary Liberalization (EVSL) initiative. In November 1998, APEC agreed to move these sector discussions on tariff reductions to the WTO for finalization and implementation on the basis of an agreed framework on product coverage, end rates and end dates. The initiative was later called accelerated tariff liberalization (ATL).

As part of the ATL on forest products, it was also agreed to conduct a survey to review the non-tariff measures affecting trade in forest products with a view towards improving trade conditions, including the harmonization of standards pertaining to wood products use in construction. The ATL expands the so-called “zero for zero” agreement among some APEC members to eliminate tariffs on forest products between themselves. A similar effort to achieve this target in the Uruguay Round failed, and the full objective of the process within APEC has also not been achieved.

Mercosur, Mercado Común del Sur or the Southern Common Market, is a subregional integration agreement involving Brazil, Argentina, Uruguay and Paraguay, with Chile and Bolivia holding a special associated status. It is now a customs union (all members have the same tariffs to the outside world) and is committed eventually to becoming a full common market. In this sense it aspires to regional integration like the EU, rather than a free trade area like NAFTA.

The Mercosur structure, though still evolving, provides several environment-related innovations. Mechanisms for public participation were provided in the original Protocol of *Ouro Preto*, through a *Foro Consultivo Económico y Social* (social and economic advisory council, which exists as part of the Mercosur institutional structure). This forum receives information from labor, business and consumer representatives. Experts from the public also attend relevant meetings of Mercosur’s many technical sub-committees.

More explicit environmental and trade linkages are made through various legal mechanisms that combine as elements of a developing regime. Several resolutions of the *Grupo Mercado Común* and decisions of the *Consejo de Mercado Común* have touched upon environmental issues. The Canela Declaration of 1992 created an informal working group, the *Reunion Especializada en Medio Ambiente*, to study environmental laws, standards and practices in the four countries. This forum evolved into the creation of a *Sub-Grupo No. 6* on the environment, which is one of the recognized technical working bodies of Mercosur. This group has discussed issues such as environment and competitiveness, non-tariff barriers to trade, and common systems of environmental information. This body has been involved for over two years in negotiating a new environmental protocol, which is being added to the Treaty of Asunción of Mercosur. The draft agreement provides a comprehensive stand-alone treaty for upward harmonization of environmental management systems and increased cooperation on shared ecosystems, in addition to mechanisms for social participation.

The European Union (EU) – holding the competence for trade policies for member states - is in a process of harmonizing all major aspects of economic policy as well as many related policy areas. At the heart of the EU is a customs union and a single market, with a common external tariff. It is a supranational organization, widely interpreted as providing for the shared exercise of its member states’ sovereignty. The EU can legislate in the sense that it can adopt binding legal instruments through the action of its institutions alone. For this purpose it has a comprehensive institutional structure, involving legislative, executive, judicial and advisory organs.

5.1.2 International Forest Regime and Multilateral Environmental Agreements

Convention on International Trade in Endangered Species (CITES)

The growing global economy is placing an increasing strain upon global ecosystems. Sometimes this strain involves the over-exploitation of species, putting them at risk of extinction. Due to the integration of

the global economy, such overexploitation appears to be often driven by international trade. As regards timber from natural tropical forests, however, it needs to be recognized that the volume of trade has not shown a growing trend.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted in 1973 to prevent over-exploitation of endangered species through international trade. The Convention bans commercial trade in species most threatened with extinction (listed in Appendix I) and strictly controls trade by means of export permits in other species that might be threatened with extinction unless trade is controlled (listed in Appendix II). The Convention also creates an Appendix III, which contains species nominated by individual Parties, for which those parties undertake to issue export permits. In 2002, seven tree species appear in Appendix I, twelve in Appendix II, and six in Appendix III, although only two are traded in significant volumes.

Recent CITES proposals to control the trade of certain timber species have been particularly controversial. Some exporting developing countries have raised concerns about the current listing criteria as they apply to trees. However, other countries have firmly defended the listing criteria as adequate for tree species, and the current polarization may well continue for some time. There are also disputes about whether there is scientific evidence that a tree species proposed for listing is really endangered or threatened by international trade. The problem is compounded by generally poor data on tropical forests, and limited information on trade flows by species.

The trade regulation of mahogany (*Swietenia macrophylla*) is a recent case in point, as the species has been proposed three times for CITES Appendix II listing, with a negative result each time (the last vote being very close). Bolivia, Brazil and Costa Rica have now listed it on Appendix III. The international attention led to the establishment of a regional Working Group on Mahogany, which has developed a number of proposals for joint actions and improved cross-border co-operation between the involved countries.

A CITES listing tends to have a negative impact on trade flows of the listed species. CITES is aware of this problem, and a Timber Working Group was established to make recommendations on proposals for listing of tree species, as well as on implementation of appropriate export controls on listed species (FAO 1997). To make CITES listing effective, adequate enforcement measures both in exporting and importing countries are needed.

The efforts by CITES to protect and improve the survival of all endangered species living in forests are widely supported because of the increasing global pressures. From the trade point of view, such trade measures as CITES listings should be limited to what is necessary to achieve the objective. On the other hand, CITES trade restrictions should be made and implemented effectively so that the survival of a species, which is endangered by commercial trade, is indeed ensured by the measures taken (Simula 1999).

The twelfth Conference of Parties (COP12) of CITES in November 2002 made the following updates:

- included *Swietenia macrophylla* in Appendix II (starting from November 2003)
- included *Araucaria araucana* in Appendix I.

Convention on Biological Diversity (CBD)

The Convention on Biological Diversity (CBD) is one of the most important of the MEAs from the point of view of forestry. Most of the environmental effects are indirect in causing changes in levels and patterns of production and consumption (WTO 1997). While recognizing the potential benefits of trade to the environment, there can also be negative effects, and therefore trade liberalization should be implemented in conjunction with environmentally sound policies (United Nations' Commission on Sustainable Development, CSD 1996). Complementarity can be observed in the WTO and CBD rules. The following inter-linkages between CBD and the WTO rules can be identified in the area of forest biodiversity (*cf.* Downes 1998; Simula 1999):

Monitoring of trade impacts on bio-diversity. CBD Article 7 requires Parties to assess and monitor the status of bio-diversity and the activities likely to interfere with conservation and sustainable use. In the forestry sector, there is a particular need to carry out bio-diversity assessments including the impacts of trade on bio-diversity.

United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change (UNFCCC) addresses the issues related to climatic influences, including the interface with forest ecosystems. The interface between forest resources and climate change has three main facets: (a) What will be the impact of climate change on forests (on which little scientific information is available). (b) An important share of carbon emissions is coming from deforestation and forest degradation, which is also the main reason for the loss of bio-diversity. (c) Enhancing the role of sinks in mitigation of emissions as outlined by the Kyoto Protocol. The Clean Development Mechanism (CDM) will be applied to afforestation and reforestation and is expected to mobilize significant amounts of financing to increase forest bio-mass in developing countries.

It is possible that the range of eligible activities for CDM will be broader after the first Kyoto commitment period (2008-2012) furthering the potential role of this instrument to raise funds for SFM in developing countries. From the trade point of view, this may become an issue when the increased carbon stocks are renewed at the age of final harvest, releasing probably significant volumes of timber for industrial use, fuelwood and other purposes. This increased supply would change market situation, both nationally and internationally. The assessment from the trade point of view would be related to the reward which the forest owner receives for the environmental service he is providing through carbon sequestration.

5.1.3 The Rio-Process and Post-UNCED Deliberations on Forests

UN Conference on Environment and Development (UNCED)

The relationship between economic development and environmental degradation was first placed on the international agenda in 1972, at the UN Conference on the Human Environment, held in Stockholm. In the following period, the notion that environmental protection and natural resources management has to be integrated with socio-economic issues of poverty and underdevelopment increased. In 1987, the UN World Commission on Environment and Development (WCED; Brundtland Commission), chaired by the Norwegian Prime-Minister Gro Harlem Brundtland, has been capturing the idea in the definition of "sustainable development" in its report "Our Common Future: The World Commission on Environment and Development", widely known as "The Brundtland Report". After considering that report, in 1989 the UNGA called for the UNCED and the process of planning and negotiations among all member states of the UN was initiated. After four sessions of the Preparatory Committee, the conference, also known as the "Earth Summit", was held at Rio de Janeiro/Brazil from 3 to 14 June 1992.

The primary goal of the conference was to come to a common understanding that social, environmental and economic needs must be met in balance with each other for sustainable outcomes in the long term. It

made history by bringing global attention to the concept of sustainable development as a workable objective for all actors at different levels and by bringing stakeholders together. It thus produced a new plan for international cooperation and policy on environmental and developmental issues.

In Rio, governments adopted **three major agreements** aimed at changing the traditional approach (that was primarily focused on economic growth) to sustainable development:

1. The **Agenda 21** is a comprehensive programme for global action in all areas of sustainable development. Divided into IV Sections and overall 40 Chapters, it addresses today's pressing problems, clarifies appropriate challenges and contains detailed proposals for action. Besides technical issues, the programme also takes into account socio-political dimensions in participatory decision-making processes. Its **Chapter 11 "Combating Deforestation"** of the Agenda 21 outlines the field of forestry. Issues being addressed are e.g. the maintenance of multiple functions of all types of forests, sustainable management and conservation of all forests, afforestation, reforestation and the establishment of capacities for planning, assessment and systematic observations of forests and processes.
2. The **Rio Declaration** is a series of 27 principles defining the rights and responsibilities of States among each other and the relationship between state and society. Amongst others, it addresses industrialised countries as the most important polluters and is calling for the integration of environment protection in all fields of policy, participation of the public and effective environment legislation.
3. The **Forest Principles** are a "*non-legally binding authoritative statement of [15] principles for a global consensus on the management, conservation and sustainable development of all types of forest*"⁶⁵. This statement is the first global consensus reached on forests. Because of differences in attitude between developing and industrialised countries, e.g. concerning the integration of all types of forests and financing mechanisms, a forest convention could not be achieved.

UN Commission on Sustainable Development (CSD)

The UN Commission on Sustainable Development (CSD) was established by the UNGA in December 1992 as a functional commission of the ECOSOC to ensure an effective follow-up of UNCED. It receives substantive and technical services from DESA/Division for Sustainable Development.

The original mandate of CSD is to review progress at the international, regional and national levels in the implementation of the outcomes of UNCED, in particular the Agenda 21. The main bases for that process of monitoring and identifying problems faced by countries are annually reports submitted by governments. In this regard, CSD strives for enabling countries to gather and report the data needed, e.g. using a list of indicators from which governments will choose those appropriate to local conditions. The role of CSD is furthermore to promote dialogue and to build partnerships for sustainable development with governments, the international community and the major groups identified in Agenda 21 as key actors.

Achieving sustainable development worldwide depends largely on changing patterns of production and consumption. In this area, CSD e.g. focuses on impacts on developing countries, including trade opportunities and assessment of the effectiveness of policy instruments, including new and innovative instruments. In 1995, the Commission also adopted a work programme on the transfer of environmentally sound technology, cooperation and capacity building. The programme places an emphasis on three interrelated priority areas: access to and dissemination of information, capacity building for managing technological change as well as financial and partnership arrangements.

The Commission meets annually in New York for a period of two to three weeks and reports to the ECOSOC and, through it, to the Second Committee of the UNGA (Economic and Financial Committee). The 1st Session was held in June 1993. A five-year review of Earth Summit progress (Earth Summit + 5; **Rio+5**) took place in June 1997 by the 19th UNGA Special Session (UNGASS) in New York. The ten-year review followed in September 2002 by the World Summit on Sustainable Development (WSSD; Earth

⁶⁵ A/CONF.151/26 (Vol. III)

Summit + 10; **Rio+10**) in Johannesburg. The 10th Session of the CSD in 2001 acted as the Preparatory Committee (PrepCom) for WSSD. The WSSD reiterated the initial functions of the CSD as a high level forum on sustainable development, and enhanced the Commission's mandate to elaborate policy guidance and options for future activities to follow up the Johannesburg Plan of Implementation.

Intergovernmental Panel on Forests (IPF) and Intergovernmental Forum on Forests (IFF)

At its 3rd Session in 1995, the CSD established an ad hoc open-ended Intergovernmental Panel on Forests (IPF) for two years (1995-1997) to provide a forum for the international forest policy dialogue. The UNGA, at its 19th Special Session in June 1997, decided to continue that dialogue on forests through the ad hoc open-ended Intergovernmental Forum on Forests (IFF). ECOSOC established the IFF, again under the auspices of the CSD, for another three years (1997-2000).

In July 1995, an informal, high level Interagency Task Force on Forests (ITFF) was set up by eight international organisations (FAO, UNDP, UNEP, ITTO, World Bank, CSD, and the Secretariat of the CBD) to coordinate the inputs of these organizations to the forest policy process.

The overall objective of IPF and IFF is to develop coherent policies to promote the management, conservation and sustainable development of all types of forests. Both institutions met four times within the appropriate period. Government and Organization Led Initiatives (e.g. Six-Country Initiative of Finland, Germany, United Kingdom, Honduras, Indonesia and Uganda) organized expert meetings to discuss particular issues before scheduling them for discussion in formal sessions.

In pursuing its mandate, the IPF was expected to focus on 12 programme elements clustered into the following five interrelated categories and to submit final conclusions and policy recommendations to the CSD at its 5th Session in April 1997:

- implementation of forest-related decisions taken during the UNCED at the national and international levels, including an examination of sectoral and cross-sectoral linkages,
- international cooperation in financial assistance and technology transfer,
- scientific research, forest assessment and the development of criteria and indicators for sustainable forest management,
- trade and the environment in relation to forest products and services,
- international organizations and multilateral institutions and instruments, including the appropriate legal mechanisms.

In February 1997, IPF-4 presented in its final report a set of proposals for action. However, IPF delegates could not agree on a few major issues such as financial resources, transfer of environmental sound technologies and trade related matters, or whether to begin negotiations on a global forest convention.

The IFF aimed at facilitating the implementation of the IPF proposals for action, i.e. at moving from dialogue to action, and at resolving several issues on which IPF had not reached consensus. In February 2000, at its final meeting, the IFF adopted a report containing additional proposals for action (see below). However, the issues related to legal and financial mechanisms affecting sustainable forest management remained too controversial for governments to reach a final agreement.

UN Forum on Forests (UNFF)

Following the IFF recommendations, ECOSOC established the UN Forum on Forests (UNFF) as a part of the IAF in October 2000. UNFF was set up as a subsidiary body of ECOSOC and thus has a comparable legal entity as CSD.

The main objective of UNFF is to carry on the five-year IPF/IFF process (1995-2000), i.e. to promote "*...the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end...*"⁶⁶ In order to achieve that objective, the following principal functions have been identified:

- to facilitate implementation of forest-related agreements (e.g. IPF/IFF Proposals for Action) and foster a common understanding on sustainable forest management;

⁶⁶ E/2000/L.32, paragraph 1

- to provide for continued policy development and dialogue as well as to address forest issues and emerging areas of concern in a holistic, comprehensive and integrated manner;
- to enhance cooperation as well as policy and programme coordination on forest-related issues;
- to foster international cooperation and;
- to monitor, assess and report on progress of the above functions and objectives;
- to strengthen political commitment to sustainable forest management.

States Members contribute to the UNFF process through dialogue and voluntary reports culminating in the annual session of the Forum. The UNFF Secretariat, as mandated by UNFF-2, has provided a suggested format for the national reports. Country and Organization Led Initiatives (e.g. Eight-Country Initiative of Australia, Brazil, Canada, France, Germany, Iran, Malaysia and Nigeria) also contribute to the development of UNFF themes.

By 2005, the UNFF will evaluate the efficiency of IAF and “...will also address the institutional framework of the United Nations Forum on Forests...” In addition, the Forum is authorised to negotiate the recommendation of a mandate for developing a legal framework on all types of forests.

Collaborative Partnership on Forests (CPF)

The Collaborative Partnership on Forests (CPF) was established by ECOSOC in April 2001, following the IFF recommendations. It is serviced by the UNFF Secretariat. Like UNFF, CPF is an element of the IAF.

The CPF is an innovative partnership of 14 major forest-related international organizations, institutions and convention secretariats: CIFOR, ITTO, IUFRO, CBD Secretariat, GEF Secretariat, UNCCD Secretariat, UNFF, UNFCCC Secretariat, UNDP, UNEP, ICRAF, World Bank, IUCN

The objectives of the CPF are to support the work of the UNFF and member countries and to enhance cooperation and coordination on forest issues. Basically, CPF

1. promotes the implementation of the IPF/IFF Proposals for Action by
 - providing information and technical assistance to countries,
 - facilitating regional and international initiatives,
 - identifying and mobilizing financial resources,
 - strengthening political support for sustainable forest management and
2. provides expertise and advisory services to UNFF by
 - preparing documentation for UNFF sessions,
 - supporting intersessional activities,

CPF reports annually on its activities to UNFF in a document entitled “CPF Framework”.

In order to carry out its work effectively and efficiently and to follow a principle of shared responsibility, the CPF has designated focal agencies and supporting agencies. The key tasks of the focal agencies include appropriate elements addressed by UNFF. For instance, in the field of criteria and indicators of sustainable forest management, FAO and ITTO are the focal agencies. They are supported by CIFOR, IUFRO, CBD and UNEP. However, the focal agency system is rather adverse in regard to the holistic approach of the implementation of the IPF/IFF Proposals for Action.

Food and Agriculture Organization

The Food and Agriculture Organization of the United Nations (FAO) helps to facilitate contacts and information flow among on-going, new and emerging processes and between these and other related programs, such as national forest programs and the global forest resources assessment in the forestry field, and works within the framework of the Convention on Biological Diversity (CBD) in the field. Also, FAO’s statistical and analytical work on trends and outlooks for forest product supply and demand is highly relevant. FAO has also monitored the developments in the tariff and non-tariff barriers to trade through a series of studies (including Bourke and Leitch 2000).

With regard to market access, FAO is giving priority to:

- Ensuring compatibility and comparability in the various on-going initiatives, as well as harmonization of forest-related concepts and definitions among them; this work has direct relevance to trade.
- Support to country capacity building and training.
- Promotion of development of appropriate links between criteria and indicators for SFM applied at (i) the national, and (ii) the forest management unit (working) levels; and appropriate linkages between these and efforts towards the development and implementation of forest certification programs.
- Publication of well-focused, practical guidelines on the assessment and measurement of indicators ensuring compatibility between the assessment guidelines, at global level;
- Assistance to countries in securing necessary resources and support, drawing on both national and external sources, for the further development, testing and implementation of criteria and indicators; support to institutional twinning between developed and developing countries to further the implementation of sustainable forest management practices.

In the area of certification, FAO will continue to maintain an interest in global trends and opportunities, related to both market and forest management aspects. As an organization, which acts as a neutral forum, it will assist where appropriate. In this respect, in association with ITTO, FAO held a consultation dealing with the subject of mutual recognition between certification processes held in Rome, in 2001.

International Tropical Timber Organization (ITTO)⁶⁷

The International Tropical Timber Organization (ITTO) was established under the auspices of the United Nations in 1986 amidst increasing worldwide concern for the fate of tropical forests. While almost everyone was alarmed at the rate of deforestation occurring in many tropical countries, there was also considerable agreement that the tropical timber trade was one of the keys to economic development in those same countries. The reconciliation of these two seemingly disparate phenomena is ITTO's story.

ITTO's origins can be traced back to 1976 when the long series of negotiations that led to the first International Tropical Timber Agreement (ITTA) began at the fourth session of the [United Nations Conference on Trade and Development \(UNCTAD\)](#) as part of that organization's Programme for Commodities. The eventual outcome of these negotiations was the ITTA, 1983, which governed the Organization's work until 31 December 1996, when it was superseded by the [ITTA, 1994](#). Negotiations for a successor to this agreement are [now under way](#), again under the auspices of UNCTAD.

As the first ITTA was being negotiated in the early 1980s, concern over the fate of tropical forests was increasing and the international community was being asked to take action. By then, conservation had become at least as important a consideration in the negotiations as trade. This was reflected in the preamble to the Agreement, in which conservation and trade were accorded equal importance. The ITTA that eventually came into operation was no conventional commodity agreement. It was, in reality, as much an agreement for forest conservation and development as for trade. In effect, it preceded the concerns which featured in the 1987 Brundtland Report and at the Earth Summit in 1992 and its trade components were as much instruments for tropical forest conservation as ends in themselves.

The [ITTA, 1994](#) builds on the foundations of the previous agreement, focusing on the world tropical timber economy and the sustainable management of the resource base, simultaneously encouraging the timber trade and the improved management of the forests. In addition, it contains broader provisions for information sharing, including non-tropical timber trade data, and allows for the consideration of non-tropical timber issues as they relate to tropical timber. ITTO occupies an unusual position in the family of intergovernmental organizations. Like all commodity organizations it is concerned with trade and industry, but like an environmental agreement it also pays considerable attention to the sustainable management of natural resources. It manages its own program of projects and other activities, enabling it to quickly test and operationalize its policy work. Other features include:

⁶⁷ see: www.itto.or.jp

- an equal partnership in decision-making, policy formulation and project development between producing members (tropical developing countries) and tropical timber consuming members (mostly temperate developed countries);
- the active participation of civil society and trade organizations in meetings and project work;
- the formulation and implementation of projects in producing member countries, using mostly local expertise;
- twice-yearly meetings of its governing body (the International Tropical Timber Council), meaning a comparatively rapid pace of debate, decisions and action.

ITTO develops [internationally agreed policy documents](#) to promote sustainable forest management and forest conservation and assists tropical member countries to adapt such policies to local circumstances and to implement them in the field through projects. In addition, ITTO collects, analyses and disseminates data on the production and trade of tropical timber and funds a range of projects and other action aimed at developing industries at both community and industrial scales. Examples include pilot and demonstration projects, human resource development projects, and research and development projects; the [Yokohama Action Plan](#) sets out the types of activities that the Organization should undertake in project and policy work. All projects are funded by voluntary contributions, mostly from consuming member countries.

Non-member stakeholders have established two advisory groups to facilitate their participation in the Council and to provide input to the Council's decision-making process. These are the Trade Advisory Group (TAG) and the Civil Society Advisory Group (CSAG).

The International Tropical Timber Agreement (ITTA) is in the very focus of the international debate on market access for tropical timber. Market access has been subject to periodic investigations. ITTO's work on this subject area was summarized in Chapter 1.1. It shows how complex the issue is and how difficult it is to make concrete progress in reducing market barriers and impediments.

ITTA is a commodity agreement, however, with a strong environmental link. ITTO has a double role: (1) promotion of trade of tropical timber, and (2) dealing with the environmental issues. The ITTO Mission Statement reads: "The ITTO facilitates discussion, consultation and international cooperation on issues relating to the international trade and utilization of tropical timber and the sustainable management of its resource base".

In carrying out its mission, ITTO has faced a large number of challenges. In the words of ITTO Yokohama Action Plan (2002): "The linkages of the supply chain from sustainably managed resource to consumer require an integrated approach to maximize synergy. Managing and harvesting the resource, processing and marketing are mutually interdependent: it is important that the development and gains in one element are incorporated fully into the others." The ITTO Yokohama Action Plan (2002) describes the strengthening of the several linkages. These include the founding membership in Collaborative Partnership on Forests (CPF)

5.2 Policy Issues, Instruments and Processes

5.2.1 Trade Debate in the Global Forest Policy Dialog

The Intergovernmental Panel on Forests (IPF) and its successor the Intergovernmental Forum on Forests (IFF), through a long process from 1992, spearheaded the development and monitoring of national forestry programmes (nfps) to cover a wide range of approaches for addressing forest sector issues in a holistic, comprehensive and multi-sectoral manner in the context of wider strategies and programmes for sustainable development. Because the IPF/IFF came under the aegis of the UN Commission for Sustainable Development, which in turn reports to the UN General Assembly, countries are under political obligation to give effect to its proposals at national level. The IPF/IFF 'Proposals for Action' consist of some 270 generic suggestions for policies, legal frameworks, forest plans and management, agreed. The UN Forum on Forests (UNFF), the successor to IPF/IFF, is charged with coordinating the implementation and monitoring of the Proposals for Action, and with organising continuing dialogue.

There are several benefits deriving from the swathe of soft law developed by the UN process. As a result of the extensive diplomatic activity, forests are established as an important international concern among politicians and officials. Civil society and business won better access to deliberations, and some of their

innovations were showcased. Coordination between the UN bodies with responsibility for forests has improved. The primacy of country-led, multi-stakeholder national forest programmes (nfps) was agreed. Finally, the limits to intergovernmental processes were accepted – especially the need to avoid imposing international precepts.

While the UNFF was intended to address trade issues, the view of NGOs (e.g. Tarasofsky 2001) is that virtually no substantive agreement or progress on these issues has occurred and that little further contribution to trade policy can be expected from UNFF. However, Tarasofsky does see a role for the UNFF in addressing the problem of illegal logging and illegal trade, areas where effective dialogue between countries is needed.

Since the international trade regime is legally based, it is a much stronger influence on forest trade than the above ‘soft’ processes and their social and environmental intentions. The rapid rise to predominance of the WTO as the trade regime ‘umbrella’ is now somewhat tempered by the increase in powerful regional and bilateral initiatives. However, neither the WTO nor regional trade organisations have forestry expertise in their staff or delegations. And it is only really ITTO in the international forest regime that is competent to help shape the trade regime, addressing the many trade uncertainties which limit progress in implementing forestry agreements and instruments, e.g. how far certification is a trade barrier.

5.2.2 Analysis of the Intergovernmental Debate on Trade in Forest Products and Services⁶⁸

From an international legal perspective, the starting point of any discussion on international trade and forest products and services is a recognition of the sovereign right of every State to exploit its own natural resources.⁶⁹ This right is restricted by the obligation of States not to cause damage to the environment of other States and areas beyond their jurisdiction, and it may also be circumscribed by treaty obligations which the State has accepted.

In the case of the trade in forestry products and services, many States have incurred obligations pursuant to the International Tropical Timber Agreement, 1994 (ITTA),⁷⁰ the Convention on Biological Diversity, 1992 (CBD),⁷¹ and the Convention on the International Trade of Endangered Species, 1966 (CITES),⁷² as well as under the Marrakesh Agreement Establishing the World Trade Organization (WTO), 1994.⁷³

With the creation of the WTO, States have created what is possibly the most important international legal regime currently in existence. Its rules undoubtedly affect the international trade in forest products and services, but they also respect the large measure of autonomy that WTO Members have to determine their own policies on the environment.⁷⁴

In November 2001, the WTO’s Ministerial Declaration at Doha (“Doha Declaration”) provided a mandate for negotiations on a variety of subjects, which have implications for the trade in forest products. The negotiations, which cover 21 listed subjects, are to be pursued until their conclusion not later than 1 January 2005.⁷⁵ In the interim, a stock-taking will take place when committees report to the Fifth Ministerial Conference in Cancún in September 2003.

The WTO was established with the conclusion of the Uruguay Round of multilateral trade negotiations, and entered into force on 1 January 1995.⁷⁶ Annexed to the WTO Agreement, and forming an integral part

⁶⁸ References and Quotations at the end of the Chapter

⁶⁹ With specific reference to forests, this principle can be found in Article 13 of the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests, 1992, UN Doc. No. A/CONF.151/26(Vol. III). The principle is also enunciated more generally in Principle 21 of the 1972 Stockholm Declaration, Rio Principle 12, and UNGA Resolutions 626, 1803, 2158 and 3171. It has been accepted as customary international law (see *Texaco v. Libya*, 53 ILR 389) and is included in treaty law, such as in the preamble of the CBD. For a discussion of the principle more generally, see Nico Schrijver, *Sovereignty over Natural Resources*, Cambridge: CUP, 1997, at pp. 260-266.

⁷⁰ 23 ILM 1195 (1984).

⁷¹ 31 ILM 818 (1992).

⁷² 12 ILM 1085 (1973).

⁷³ 33 ILM 1125 (1994).

⁷⁴ Appellate Body Report, *US – Standards for Reformulated and Conventional Gasoline* (“*US – Gasoline*”), WT/DS2/AB/R, adopted 20 May 1996, DSR 1996:1, 3, p. 30.

⁷⁵ Ministerial Declaration adopted on 14 November 2001 by the Ministerial Conference, Fourth Session, Doha, WT/MIN(01)/DEC/1 (“Doha Declaration”).

⁷⁶ Marrakesh Agreement Establishing the World Trade Organization, 1994 [hereinafter the WTO Agreement].

to it, are various multilateral and plurilateral agreements, some of which have important implications on how the WTO's 146 Member States⁷⁷ regulate their trade of forestry-related products and services.

The work of the WTO is carried out by various committees and councils, whose membership consists of all WTO Members. For the most part, these bodies report directly to the General Council. The plurilateral committees, like the Committee on Government Procurement, do not include all WTO Members, only those Members that have ratified the Government Procurement Agreement. Therefore, although it has a duty to inform the General Council of its activities, negotiations in this Committee do not affect all WTO Members.

The General Council is the key decision-making branch of the organisation on almost all issues, and also acts as the Trade Policy Review Board and the Dispute Settlement Body.⁷⁸ It carries out the day-to-day work between ministerial conferences. It is made up of the 146 Member States of the WTO, each one having an equal say. The only body that has more authority than the General Council is the Ministerial Conference, which is made up of the international trade ministers from all Member States. It has the authority to take decisions on all matters under any of the multilateral trade agreements.⁷⁹ Although it is technically distinct from the General Council, the Ministerial Conference relies on the General Council to carry out its day-to-day activities, given that it meets only every second year.

Multilateral Environmental Agreements (MEA) and WTO

To date, the Members that have shared their opinions have largely agreed upon the meaning of a "multilateral environmental agreement". It is a legally binding instrument between at least three parties that has as an objective the protection of the environment, and which is open to all countries concerned from the start of negotiations.⁸⁰

The WTO agreements are based on a few core tenants. These are the reduction and eventual elimination of barriers to trade and the guarantee of non-discrimination. Non-discrimination obliges each Member to treat products of other Members in a manner that is no less favourable than the treatment afforded to national products and to the products of a Member's most favoured nation. Typically, the agreements also contain exceptions to the core rules. In GATT Article XX, for example, exceptions are provided for measures that are necessary to protect plant life or health and measures that relate to the conservation of exhaustible natural resources.⁸¹

The objectives of the Convention are "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources," including by access to them and transfer of technologies.⁸² The Convention leaves implementation up to the parties, and imposes obligations on States to comply with the Convention to the highest level possible given their capabilities and resources.

As its name suggests, the objective of CITES is to control the trade in endangered species and their parts so as to ensure that their survival is not threatened. It establishes trade controls, which require that all import, export, re-export and introduction from the sea of species covered by the Convention has to be authorized through a licensing system.

The objectives of the Agreement include the promotion and enhancement of the tropical timber trade, encouragement of reforestation and sustainable use and management of forests, and perhaps most importantly for our purposes, consultation and co-operation between members.⁸³

Meaning of STOs

The subject of the relationship between MEAs and the WTO is not new to the CTE. Previous CTE discussion on this relationship, however, focused on "trade measures" for environmental purposes, rather

⁷⁷ As of 4 April 2002.

⁷⁸ WTO Agreement, Article IV(2), (3) and (4).

⁷⁹ WTO Agreement, Article IV(1).

⁸⁰ Argentina, TN/TE/W/2; EU, TN/TE/W/1; Chinese Tapei, TN/TE/W/11; India, TN/TE/W/23; Japan, TN/TE/W/10; note however that Japan has also suggested that MEAs that have been signed and adopted but are not yet in force should also be included in discussions.

⁸¹ GATT, Article XX(b) and (g).

⁸² CBD, Article 1.

⁸³ ITTA, Article 1.

than on “specific trade obligations”, as stipulated in the Doha Declaration. The term “STO” is thought to have a more particular meaning than the term “trade measures”. All negotiating Members seem to agree that the form of a trade obligation includes many possibilities, ranging from trade bans to notification procedures or labelling requirements. However, there is disagreement on whether an STO covers non-mandatory measures, or measures for which implementation depends upon the discretion of parties to the MEA.

Although Switzerland has identified both of these MEAs as “setting out types of measures and policies that can and must be adopted in pursuit of a specific objective negotiated by the contracting parties,” Korea has explicitly denied the existence of an STO in either of the treaties.⁸⁴ CITES has been identified by the EC as an agreement for which trade measures have been key to its success.⁸⁵ Members tend to agree that it contains STOs, pointing particularly to Articles III, IV, V and VI.⁸⁶ There is disagreement between the US, on the one hand, and Korea and India, on the other, over whether Article VIII also contains STOs.⁸⁷ In the opinions of Korea and India, neither Article VIII nor Article XIV contain STOs.

Relationship between Existing WTO Rules and Specific Trade Obligations

When it comes to the relationship between STOs and the WTO, many Members have expressed the view that an STO should not always be automatically presumed to be in conformity with WTO rules.⁸⁸ Instead, according to Chinese Taipei, the legitimacy of a trade measure should be examined in light of the principles of necessity, proportionality, and transparency, and in light of whether it is based on sufficient scientific evidence and whether it conforms to the chapeau of Article XX.

In the opinion of the EC, Norway and Switzerland, on the other hand, MEAs and the WTO are mutually supportive, especially with respect to the common goal of sustainable development.⁸⁹

Dispute Settlement Body (DSB)

At times, the General Council convenes to discharge the responsibilities of the DSB,⁹⁰ which is charged with the administration of the Dispute Settlement Understanding (DSU). The DSB is empowered to establish panels, adopt panel and Appellate Body reports, monitor the implementation of rulings and recommendations and authorize the suspension of concessions when a Member does not comply with a ruling.⁹¹

The dispute settlement mechanism is one of the cornerstones of the organization. It levels the playing field by giving access to all WTO Members binding dispute settlement. Also, it adds to Members’ confidence that their mutual commitments and obligations will be respected. It does not impose new trade obligations, but is used by Members to enforce the WTO covered agreements.

The CBD and TRIPS Article 27.3: Traditional Knowledge and Access to Genetic Resources of Forests

The TRIPS Agreement attempts to introduce a greater degree of order and predictability to the way that intellectual property rights are protected around the world by bringing them under common international rules. It establishes minimum levels of protection that each Member has to give to the intellectual property of other WTO Members. In doing so, it strikes a balance between the long-term benefits and possible short-term costs to society. The idea is that society benefits in the long-term when intellectual property protection encourages creation and invention, especially when the period of protection expires and the creations and inventions enter the public domain.

⁸⁴ TN/TE/W/13, para. 10.

⁸⁵ TN/TE/W/1.

⁸⁶ India, TN/TE/W/23; Japan, TN/TE/W/10; Korea, TN/TE/W/13; Norway, TN/TE/W/25; US, TN/TE/W/20.

⁸⁷ US, TN/TE/W/20; Korea, TN/TE/W/13; India, TN/TE/W/23.

⁸⁸ Australia, TN/TE/R/1, para. 20; Brazil, TN/TE/R/2, para. 17; Chile, TN/TE/R/1, para. 24; Chinese Taipei, TN/TE/W/11, para. 9; Cuba, TN/TE/R/2, para. 56; Hong Kong, China, TN/TE/R/1, para. 35; Pakistan, TN/TE/R/1, para. 43; US, TN/TE/R/2, para. 9.

⁸⁹ EC, TN/TE/W/1; Norway, TN/TE/W/25; Switzerland, TN/TE/W/4.

⁹⁰ WTO Agreement, Article IV(3).

⁹¹ DSU, Article 2(1).

Article 27 of the *TRIPS Agreement* provides broad subject matter scope for patent protection, extending it to products and processes in all fields of technology. It also provides that Members will not discriminate with respect to the enjoyment of patent rights based on the place of invention, field of technology, or whether products are imported or locally produced.

Paragraph 3 of Article 27 provides that “Members may also exclude from patentability:

- (a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;
- (b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. [...]

The exclusions in Article 27:3 seem to be narrowly framed, but do leave substantial room for interpretation. What is clear is that paragraph (b) allows for the exclusion of animals and plants from patent protection, but does not allow this exclusion for certain microbiological products and processes. Moreover, it requires Members to provide plant variety protection either through patents or by a *sui generis* system.

The objectives of the Convention on Biological Diversity (CBD) are “the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources,” including by access to them and transfer of technologies.⁹²

Biosecurity and biosafety

The term “biosecurity” - in increasingly common currency, and as used by FAO - encompasses all policy and regulatory frameworks to manage risks, including relevant environmental risks, which are associated with food and agriculture, fisheries and forestry. A related term, “biosafety”, is used in the Cartagena Biosafety Protocol (see below), where it specifically refers to the release and cross-boundary movement of living modified organisms (LMOs). Trade liberalisation and its associated increases in travel and transport of goods have led to an increase in the movement of living organisms across borders. Biosecurity policy frameworks are thus becoming increasingly important, and affect forest trade in three main areas:

- *Forest plant protection and phytosanitary hazards.* This covers such issues as quarantine legislation and measures and the prevention and control of insect pests and diseases, and is covered at the international level by the International Plant Protection Convention.
- *Alien invasive species.* Invasive species are a growing concern because of increase in trade and travel, and may affect the forest sector in two different ways: Firstly, invasive plants or animals may pose a risk to a particular forest species, habitat or ecosystem. Indeed, invasive alien species are recognised as one of the greatest threats to the ecological and economic well-being of the planet, ranking second among the major causes of biodiversity loss. Secondly, forest trees may also invade degraded habitats, agricultural or grazing lands, or even other forest types. The naturalisation and uncontrolled expansion of exotic trees and shrubs outside their introduction area is often considered to be negative. International agreement on how to address the trade-related aspects of invasive alien species is weak as yet, although the CBD and other international bodies have recognised the importance of the issue (as have various Criteria and Indicators initiatives). In 2002, FAO issued guidelines on the surveillance of invasive wood-borers – which is an increasing problem in many countries as untreated solid-wood packaging is used in trade.
- *Genetically modified organisms* have caused increased concern about environmental risks related to their use in the food and agriculture sectors (including forestry and fisheries). The transboundary movement of LMOs is now subject to multilateral consensus in the form of the Cartagena Protocol on Biosafety, which entered into force on 11 September 2003. The Protocol also establishes a “Biosafety Clearing-House” to facilitate the exchange of information and experiences on LMOs and to assist countries in the implementation of the Protocol. However the application of precautionary measures, as captured in the Protocol, have in recent years come under attack in the WTO as unwarranted barriers to international trade. As a result, several issues relating to the implementation of the Biosafety Protocol and the development of international consensus on the trade-related aspects of

⁹² CBD, Article 1.

invasive alien species are uncertain. Indeed the current US-EU dispute on genetically modified organisms serves to highlight these problems.

Genetic modification of forest tree species has been contemplated for addressing traits such as virus resistance, insect resistance, lignin content and herbicide tolerance. There is no reported commercial production of genetically modified forest trees, although a 1999 study indicated that since 1988 there have been 116 field trials in 17 countries and involving at least 24 tree species (FAO, 2003). It is acknowledged that biosafety aspects of genetically modified trees need careful consideration, especially because of the long generation time of trees and the potential for dispersal of pollen and seed over long distances. Along with these other aspects of biosecurity, trade in LMOs is likely to be a significant challenge for policy frameworks aiming to influence forest trade in coming years.

Differing Views on Whether the CBD and TRIPS Conflict

It has been suggested that as much as 90 percent of the world's traditional knowledge and genetic materials are located in developing countries.⁹³ It is therefore not unexpected that a north-south divide has developed on the issue of intellectual property rights when it comes to traditional knowledge and access to genetic materials.

The main issues up for discussion in the TRIPS Council are whether there is a conflict between the TRIPS Agreement and the CBD, and whether something needs to be done by the TRIPS Council to ensure that the two instruments are applied in a non-conflicting and mutually supportive way. However, as with other topics of negotiation in Doha, these matters have been stalled.

One View: Inherent Conflict between TRIPS and the CBD : By requiring that certain genetic material be patentable or protected by *sui generis* plant variety rights and by not preventing the patenting of other genetic material, TRIPS allows genetic resources to be appropriated by private parties. This, they claimed, runs counter to Article 3 of the CBD,⁹⁴ which guarantees the sovereign right of States over their own genetic resources.

Discussions predating the Doha negotiations demonstrate that the Members have mostly been engaged in discussions on procedural matters rather than on substantive issues. This has included a debate over which negotiating forum is best suited to tackle the issues. As per usual, those States that want reform would like the negotiations to take place in a forum where action can be taken, the TRIPS Council, not outside the WTO or in the CTE, which can merely recommend action.

Another View: TRIPS and the CBD Are Mutually Supportive: Contrary to the view expressed by many developing countries, Canada, the EC, Japan, Norway, Switzerland and the US have argued that there is no conflict between the CBD and TRIPS.

On the other hand, those that want a continuation of the status quo and resist a revision of the TRIPS Agreement prefer discussions to take place in their respective frameworks, including WIPO or in the CTE, which has also been given a mandate to pursue negotiations on the relevant provisions of the TRIPS Agreement.⁹⁵ In their opinion, the TRIPS Council should only deal with issues not already tackled by WIPO.⁹⁶

A Third View: TRIPS and the CBD Potentially Conflict: A third view was expressed that there is the potential for conflict between the two agreements, depending on the way the agreements are implemented at the international and national levels⁹⁷, there is a high degree of interaction between them.⁹⁸ These countries argue that it would be more cost-effective to establish an internationally accepted solution to avert biopiracy rather than divert national resources to expensive judicial processes for the revocation of

⁹³ Thomas Cottier, "The protection of genetic resources and traditional knowledge" (1998) JIEL note36,p 564

⁹⁴ Kenya, on behalf of the African Group, IP/C/W/163.

⁹⁵ Doha Ministerial Declaration, para. 32(ii).

⁹⁶ Switzerland, IP/C/M/35, para. 247; see also the pre-Doha statement by Australia along the same lines, IP/C/M/28, para. 150.

⁹⁷ Brazil, IP/C/M/29, paras. 146-148; India, IP/C/M/30, para. 169; Indonesia, IP/C/M/32, para. 135; Norway, IP/C/M/32, para. 125; Venezuela, IP/C/M/28, para. 165.

⁹⁸ Australia, IP/C/W/310; Czech Republic, IP/C/M/33, para. 126; EC, IP/C/M/35, para. 233; Japan, IP/C/M/32, para. 142; Norway, IP/C/M/32, para. 125 and IP/C/W/293.

patents that include illegal genetic resources, as has already been experienced by India and Amazonian countries. The TRIPS Agreement should be implemented in a way that is supportive of the CBD.⁹⁹

Early Quest for Solutions

First, Australia and Japan have suggested exploring the possibilities to make more effective use of the existing intellectual property system to protect traditional knowledge.¹⁰⁰ *Second*, a proposal by Switzerland that has been supported by the EC, India, Brazil and the US, suggested the establishment of a database on traditional knowledge and genetic resources to help prevent the grant of patents for subject-matter that should not be patentable.¹⁰¹ *Third*, the US put forth the position that the best way to address issues of traditional knowledge is through a system of bilateral contracts between the holders of such knowledge and persons or companies wishing to access it.¹⁰² *Fourth*, Brazil and Indonesia promoted the use of a *sui generis* system of protection of traditional knowledge. A system that provides proprietary rights can ensure that market forces will operate to generate fairness and equity.¹⁰³

Finally, many countries, led by Brazil, pushed for a patent application system that contains disclosure requirements.

- a) the source of any genetic material used in a claimed invention;
- b) any traditional knowledge used in the invention;
- c) evidence of prior informed consent from the competent authority in the country of origin of the genetic material; and
- d) evidence of fair and equitable benefit sharing.¹⁰⁴

According to Brazil and India, these requirements would create greater legal certainty and predictability for governments, investors, traditional communities and researches.

On the other hand, Japan, Korea, the US and Norway have argued that these requirements would be unnecessarily burdensome, costly and, according to the US, would encourage investors to keep their inventions secret rather than applying for patents.¹⁰⁵ Unlike other developed countries, however, the EC has not been adverse to the implementation of a disclosure system.

Labelling

Over the past years there has been a significant increase in the number of timber labelling and certification schemes. It has been estimated that currently some 109 million hectares of forest is certified in some manner.¹⁰⁶

Forest certification remains one of the most contentious issues in international forest policy because it is a trade-related instrument and States feel that it could influence their competitiveness and market access.¹⁰⁷ "The issue of 'packaging, labelling and recycling' requirements [...] resulted in North-South coalitions and pitted northern governments against each other, as demonstrated by ongoing disputes involving Canada and the United States against EU labelling of wood products, and EFTA's early challenge to EU packaging and labelling requirements."¹⁰⁸

The eco-label debate has taken on increased importance over the years, taking place in the Committee on Trade and Environment (CTE) and in the TBT Committee. The most specialised treaty to regulate labelling, is the Agreement on Technical Barriers to Trade.

⁹⁹ China, IP/C/M/35, para. 248.

¹⁰⁰ Australia, IP/C/W/310; Japan, IP/C/M/29, para. 157.

¹⁰¹ Switzerland, IP/C/W/284; EC IP/C/M/32, para. 137; India, IP/C/W/198; Brazil, IP/C/W/228; US, IP/C/W/257.

¹⁰² Brazil, IP/C/W/228; Indonesia, IP/C/M/32, para. 134.

¹⁰³ Brazil, IP/C/W/228, IP/C/M/32, para. 128, IP/C/M/33, para. 121.

¹⁰⁴ Japan, IP/C/M/32, para. 142; Korea, IP/C/M/32, para. 240; US, IP/C/W/216, IP/C/W/209; Norway, IP/C/W/293.

¹⁰⁵ ITTO, *Forest Certification: Pending Challenges for Tropical Timber*, (Technical Series 19, October 2002).

¹⁰⁶ ITTO, *Forest Certification*, *supra* note 106, p. 7.

¹⁰⁷ Gregory C. Shaffer, "The World Trade Organization under Challenge: Democracy and the Law and the WTO's Treatment of Trade and Environment Matters," (2001) *Harv. Env. LR* 25, p. 30.

The TBT Agreement does not contain exceptions like those found in GATT Article XX that apply to the whole Agreement. Instead the preamble holds that “no country should be prevented from taking measures necessary to ensure the quality of its exports, or for the protection of human, animal or plant life or health, of the environment”.

One of the most basic requirements found in the TBT Agreement is that technical regulations or standards should not be applied in a manner that results in less favourable treatment being afforded to imported products as compared to like products of national origin.¹⁰⁹ Therefore, one of the basic questions regarding a scheme to label products from sustainably managed forests, for example, is whether the labelled timber is deemed to be ‘like’ timber products that are not labelled.

According to the WTO Appellant Body, the determination of “likeness” is based on four general criteria: (i) the properties, nature and quality of the products; (ii) the end use of the product; (iii) consumer taste and habits in respect of the product and (iv) the products’ tariff classification.¹¹⁰ The list of criteria does not seem to allow for differentiation of products based on their production and processing methods (PPM).

The TBT agreement distinguishes between schemes with which compliance is voluntary, called standards,¹¹¹ and those that demand mandatory compliance, technical regulations.¹¹² The rules for technical regulations are in the TBT agreement itself, while rules that apply to standards are described mostly in the Code of Good Practice for the Preparation, Adoption and Application of Standards (the Code) annexed to the TBT agreement.¹¹³

Although it is frequently assumed that voluntary eco-labelling schemes would not fall within the scope of the TBT Agreement, there are many indications that they could in fact be covered by the TBT, including the Code. Importantly, the annexes are an integral part of the TBT agreement.¹¹⁴

The Doha Declaration goes on to give the CTE a mandate to focus on environmental labelling requirements. The mandate is to identify “the need to clarify relevant WTO rules.”¹¹⁵

The role of the CTE on labelling differs even from the day-to-day work of the TBT Committee in that it is in a position to provide recommendations only. As such, the topic of labelling in the CTE can be described at best as a forum for discussion and proposal-making rather than result-driven negotiations.

To date, the CTE has struggled over how to deal with an issue that most Members recognise as belonging to the TBT Committee. In June 2002, the EC remarked on the growing concern over the impact of labelling on trade, as demonstrated by the fact that the number of TBT notifications relating to labelling was higher than in any other year.¹¹⁶ Given the increased concern about labelling expressed by Members, as well as the potential trade impacts, some Members have expressed that in addition to the on-going work in the CTE, a deepening of discussion on the issue of labelling should take place in the TBT Committee.¹¹⁷

Public Procurement

Government procurement occurs when governments purchase goods and services, including photocopy paper, building supplies and many other products derived from forest resources. Government expenditures typically make up a large portion of GDP, between 10 and 25 percent in OECD countries, having an enormous influence on economies and on the environment.¹¹⁸ This has led governments to consider green procurement strategies to favour environmental protection and reduce damage to the environment.

Unlike the TBT Agreement and other WTO agreements, the GPA is plurilateral not multilateral, meaning that not all WTO Members are party to it. In fact, less than thirty States are currently party to the Agreement, and this includes the EC as well as its fifteen member States. All Parties are developed

¹⁰⁹ Ibid.

¹¹⁰ *EC-Asbestos*, AB Report, adopted 5 April 2001, WT/DS135/AB/R, para. 80.

¹¹¹ See Annex 3 of the TBT Agreement, the Code of Good Practice for the Preparation, Adoption and Application of Standards (the Code).

¹¹² TBT Agreement, Article 2.

¹¹³ For more on this topic, see Carlos Lopez-Hurtado, “Social Labelling and the WTO Law,” (2002) 5 JIEL 719.

¹¹⁴ TBT Agreement, Article 15.5.

¹¹⁵ Doha Declaration, para. 32(iii).

¹¹⁶ G/TBT/W/175, WT/CTE/WE/212.

¹¹⁷ Japan, G/TBT/W/176; EC, G/TBT/W/175.

¹¹⁸ IISD, *Environment and Trade: A Handbook*, UNEP, IISD, 2000, p.59.

countries, however, a number of Eastern European countries, Chinese Taipei and Panama are currently negotiating their accession to the GPA.

Like with the WTO's agreements, the cornerstone of the GPA is non-discrimination. In respect of the procurement covered by the Agreement, Parties are required to give the products, services and suppliers of any other Party treatment 'no less favourable' than that they give to their domestic products, services and suppliers.¹¹⁹ The GPA relies heavily on transparency of national laws, regulations, procedures and practices. The Agreement¹²⁰ also contains exceptions from its obligations in order to protect human, animal or plant life or health.¹²¹

By limiting the negotiations to transparency issues, the Ministerial Conference demonstrates the hesitation among Members to push for an all-encompassing multilateral treaty on procurement. Moreover, by stalling the negotiations until after the Fifth Ministerial, in September 2003, the Ministerial Conference is tacitly admitting that an agreement will not be easy to achieve. According to the mandate, the success of multilateral agreement hinges on the requirement to help developing countries in matters of technical assistance and capacity building. They must be assured that their development priorities will be taken into account.

The Ministers call for negotiations to build on the progress made in the Working Group on Transparency in Government Procurement, a body whose original mandate was to develop elements for inclusion in an appropriate agreement.¹²² Again, this open language seems to admit that whatever gains have been made to date by the Government Procurement Committee, will not necessarily be maintained in the new negotiations. What is clear from the negotiations is that the environmental dimension to procurement has received no attention thus far,¹²³ despite discussions predating Doha on whether or not to include GATT Article XX-like exceptions in an agreement.¹²⁴

5.2.3 Current State of Discussion and Implementation Related to Illegal Logging and Trade in Forest Products¹²⁵

Worldwide, illegal logging and trade threaten the environment, the forest economy and rural livelihoods. In many forest rich countries, particularly those in the developing world, illegal logging exceeds legal operations, sometimes by a large margin. Illegal logging worldwide is a multibillion-dollar operation, reaching as much as \$ 10 billion a year. In addition, failure to collect appropriate rents from timber concessions – some of which may be due to practices that violate the law -- is estimated to cost countries some \$ 5 billion a year in lost government revenues (World Bank, 2002). An undetermined but substantial volume of forest products is also traded illegally.

Illegal logging and trade is a worldwide phenomenon present not only in developing countries, where the problem is more serious, but also in several industrialized countries. Moreover, an assortment of corporations from advanced countries illegally harvest and trade forest products in both, home countries and abroad. Thus, actors from both the developing and the industrialized worlds are engaged in illegal logging and trade.

Illegal logging and trade has a number of intensely deleterious effects. Besides losses of Government revenues they result in patterns of use of resources that have little to do with economic efficiency or environmental quality. Illegal activities undermine sustainable forest management operations. They also tend to work against the well being of the rural poor, when these lose out to powerful interests that, using fraudulent methods, take control of forest resources of vital importance for their subsistence. In various cases, illegally sourced and exported timber has been instrumental in financing regional or national conflicts, the so-called "Conflict Timber" (Marijnissen, 2003).

¹¹⁹ Article III:1 of the GPA.

¹²¹ Article XXIII of the GPA.

¹²² WT/MIN(96)/DEC, para. 21.

¹²³ Konrad von Moltke, "After Doha – Assessing the outcomes of the WTO Fourth Ministerial," April 2002, available at www.issd.org.

¹²⁴ WT/WGTGP/W/32, para. 20.

¹²⁵ See World Bank www.worldbank.org/forestry/afleg, Forests Monitor <http://www.forestsmonitor.org/news/news.htm>, and IUCN Regional Office for West Africa <http://www.iucn.org/places/brao/eng/programmes/forets/afleg/afleg.htm>

Global awareness of the many problems associated with illegal logging and trade has increased sharply during the last few years. While in various countries some of the actions that contribute to the control of illegalities, such as legal reforms and improved monitoring of forest resources, were in the past included in initiatives to enhance the levels of forest governance, there were few specific concerted efforts to attack illegal acts *per se*, to mainstream law compliance considerations in policy and legislative design. Some activities such as those associated with corruption were considered as taboo and avoided in debates at international forums.

Today, it is recognized that controlling illegal activities in the forest sector is a necessary condition for sustainable forest management. Furthermore, it is now widely accepted that, in this undertaking, advanced and developing countries share a responsibility because of the influence of trade and highly mobile investment in the improving law compliance in the sector.

The idea of managing trade of forest products by rejecting imports of those that could not be proven to be legally sourced, while favoring or accepting those that can, has gained considerable acceptance during the last few years.

But controlling trade is just one tool. Industrialized countries and other groups, recognizing the limited impact that an international trade exclusion could have on the overall volume of illegally sourced and traded wood (only a small proportion of the total volume of wood harvested in developing forest rich exporter countries), also started implementing initiatives to improve law compliance in exporting countries, including measures not directly related to international trade, such as reforming policy and legislation and supporting mechanisms for increasing transparency in decision making.

Further, while national governments remain the most important actors with regard to legislation and enforcement, NGOs, private businesses, institutional investors and consumer groups are also playing a role in shaping new policy instruments for the control of unauthorized activities in the forest sector. In particular, international NGOs have been effective in raising awareness of the nature and magnitude of the problems and in prodding governments to organize corrective actions. Boundaries between initiatives by different groups interested in controlling illegal logging and trade are becoming blurred as coalitions involving various actors organize joint actions. For example, there are several cases of international NGOs and advocacy groups acting in concert with interested government in detecting forest crime and documenting illegal activities as well as in designing policy reforms.

What is illegal logging and trade?

The international debate has yet to agree on a proper definition of illegal logging and trade. The main issues in achieving a widely accepted operational definition of illegal activities are;

- What is the scope of illegal acts?
- How to harmonize societal objectives in different societies?
- How to handle the dynamic nature of laws and regulations that constantly change over time?
- How to distinguish between laundered wood and other illegal wood?
- Should we distinguish between illegal and criminal acts?

What acts should be included in a definition of illegal logging and trade?

In its narrower connotation, illegal logging occurs when timber is harvested in unauthorized ways, in violation of established laws and regulations (See Callister, 1999; FAO 2002; Commission of the European Communities, 2003). For example, wood may be harvested in excess of legal limits, in places where such harvest is prohibited such as in national parks and protected areas, in locales where forests provide essential environmental services such as upper watersheds and riparian zones. Wood may be simply stolen from the rightful owners

The production, trade and consumption chain is long, involving many other activities associated with just cutting wood and some of these activities are often included in the definition of illegal logging. For example, the definition of illegal logging in Malaysia includes unauthorized construction of infrastructure and forest roads, encroachment of forest reserves for agricultural activities, the employment of unlicensed workers and contractors, unregistered machinery and “other” (unspecified) breaches of rules and regulations (MTC, 2002).

The Royal Institute of International Affairs has adopted a broader definition of illegal logging:

“Illegal logging takes place when timber is harvested, transported, bought or sold in violation of national laws. The harvesting process itself may be illegal, including corrupt means to gain access to forests, extraction without permission of from protected area, cutting of protected species or extraction of timber in excess of agreed limits”. Illegalities may also occur during transport, including illegal processing and export, misdeclarations to customs, and avoidance of taxes and other charges”

There are no clear rules for establishing the boundaries of the set of activities covered under the definition of illegal logging and trade. For example, should wood originating in forest lands acquired with illegal proceeds be considered illegal, when the enterprise has followed all rules and regulations related to land acquisition and forest management? The economic and social environment in which wood is produced, harvested, transported and sold is broad and a single activity in the forest sector could be related to many others in other sectors, some of which may be illegal. Obviously, at some point a boundary must be set but it is not clear, or universally accepted, where this boundary should be.

In this report, and interpreting the span of actions discussed in the international debate on the subject, we have adopted the categorization “illegal logging and trade” to encompass illegal harvest, transportation, processing and trade of wood products. Thus, practically all unauthorized major activities in the forest sector are part of “illegal logging and trade” concept. The box below contains a list of examples of illegal logging and trade activities.

A vast number of initiative, bilateral agreements, programs and support mechanisms have been established in the recent past. After the major regional meeting of the Forest Law Enforcement and Governance (FLEG) process for South east Asia in September 2001, the Bali Declaration has triggered many actions on the ground particularly in Indonesia. In October 2003, the first Africa Forest Law Enforcement and Governance (AFLEG) meeting was and it is designed to fit within the New Partnership for Africa’s Development (NEPAD) and the process of the Ministerial Conference on Forests (COMIFAC) in Central Africa. Including the bilateral agreements between Indonesia and China, Japan, Norway and Great Britain, all of these initiatives and measures are aimed voluntary cooperation and are so far not subject to trade disputes.

Any attempt to manage international trade to preclude illegally sourced and traded forest products from reaching markets in consumer countries opens the possibility of a challenge at the World Trade Organization (WTO). Considering the international trade regime of the WTO, measures potentially discriminating against trade of illegally sourced timber, below the relevant legal provisions of WTO are listed and analysed.

A challenge in WTO could happen mainly in the context of two agreements, the General Agreement on Tariffs and Trade (GATT) and the Agreement on Technical Barriers to Trade (TBT). There are several articles in both agreements that could be used to defeat an initiative to prevent imports of illegally sourced wood (see Box 5.1 below).

Box 5.1 Examples of illegal logging and trade activities

Illegal logging

- Logging protected species
- Duplication of felling licenses
- Girdling (ring barking) to kill trees so that they can be legally logged
- Contracting with local entrepreneurs to buy logs from protected areas
- Logging in protected areas
- Logging outside concession boundaries
- Logging in prohibited areas, such as steep slopes, riverbanks and water catchments
- Logging under/oversized trees from public forests
- Extracting more timber than authorized
- Reporting high volumes extracted in forest concessions to launder wood extracted from non-authorized areas outside the concession.
- Logging without authorization

Illegal timber transport

- Transporting wood without authorization
- Transporting illegally harvested timber
- Falsifying and/or reusing transportation documents

Illegal trade

- Smuggling timber
- Exporting and importing tree species banned or restricted international law, such as CITES
- Exporting and importing wood in contravention of national bans
- Trading in species or dimensions or types of wood forbidden by law
- False export or import declarations

Illegal forest products processing

- Operating without a processing license
- Ignoring environmental, social and labor laws and regulations
- Using illegally logged wood in industrial processing

Abuse of transfer pricing, use of illegal accounting practices, money laundering and other financial crimes

- Declaring lower values and volumes exported
- Declaring higher purchase prices of inputs such as logging, transportation and processing machinery and services from associated companies
- Manipulating cash flows to transfer money to subsidiaries or to parent company to avoid paying taxes in the country of operation
- Money laundering
- Under grading, undervaluing, under measuring and misclassification of species exported or for sale in the local market to avoid tax liabilities.

Box 5.1 Examples of illegal logging and trade activities- continued

Corrupt activities

- Obtaining logging concession through bribes
- Bribing road and customs police and other controllers
- Restricting information about timber concessions to a few favored companies
- Establishing unnecessary qualification requirements to exclude unwanted companies from concession contracts
- Leaking confidential concession bidding information to preferred contractors
- Other manipulation of bidding processes to suppress competition.

The GATT articles rule out discrimination in trade of “like” products from members or between imports and products of domestic origin. They also prohibit import restrictions other than import duties, taxes, fees or other charges. Because restrictions such as licenses should be avoided under GATT, given that they discriminate between exporting countries, they could be challenged. However, some point out that this challenge could be neutralized in all cases where importer and exporter countries *voluntarily* enter into an agreement to restrict trade. The country that accepts the restriction is the one at disadvantage, the one discriminated against. Therefore, it could be convincingly argued that discrimination is not against third countries.

On the other hand, any restriction such as a license, that is not an import duty or other import charge, could be challenged under GATT Article XI. This would be considered as a technical regulation and therefore fall under TBT. With regard to TBT Article 2.1, a challenge would hinge on the de definition of illegal and legal timber and on whether these two types of products are “like” products.

Unfortunately, the Agreements provide no definition of what “like” products are. In theory, the concept could refer to the characteristic of the *product* itself or also include the features of the production *process*. If the clause is interpreted as forbidding discrimination based on how wood is harvested and processed, then restrictive measures such as verification of legality may be challenged. The GATT/TBT agreements do not provide an objective and easy basis to pass a judgment on this theme. However, even if illegal and legal timber were considered as “like” products, GATT does not rule out process based trade discrimination under certain circumstances (Brack, 2003). Furthermore, discrimination between like products is possible under GATT Article XX

In connection with TBT Article 2.2, WTO also gives little guidance on how to interpret the mandate to “avoid unnecessary obstacles to international trade”. However, the Article allows for the need to fulfill a legitimate objective including animal or plant life, or health and the environment. The control of illegal logging can be argued to protect the environment and therefore be justified under the provisions of this article.

Since there is no international standard defining illegal wood, Article 2.9 would require members to comply with the notification requirements.

Overall, these articles do not seem to pose insurmountable problems for schemes restricting illegal wood from importing markets. It is interesting that some restrictive measures such as the licensing schemes similar to the one proposed in the European Plan of Action exist and have not been challenged in the WTO because all participants are involved voluntarily (Brack, 2003). This leads many to conclude that a WTO dispute involving a verification and licensing scheme as the one in the European Plan of Action, although possible, would probably not arise.

However, there is no relevant experience with the application of the TBT agreement to illegal wood and therefore no precedent that would allow a more definitive judgment on the possible success of a challenge to restrictive trade measures against illegally sourced wood. Only time and experience can provide a definitive answer to this debate.

The Communication from the Commission to the Council and the European Parliament

In May 2003, the European Commission issued a so-called communication to the European Parliament proposing a package of measures to address the problem of illegal logging and trade, including a Plan of Action (Commission of the European Communities, 2003). In line with the results of the regional FLEG, the plan is one of the most comprehensive international initiatives to fight illegal logging and associated trade to date. Through the Plan of Action, the EU will help interested countries set up a voluntary scheme of licenses to check the legal origin of forest products. Producing country partners would allow wood exports to the European Union only when their legal origins can be validated according to a standardized procedure. The process would be monitored by independent entities. The EU would also support activities aimed at restricting investments in activities that may induce illegal activities, and address problems arising from the use of illegally sourced forest funds to finance armed conflicts.

Specifically, the Plan would:

- i) Foster development cooperation to implement measures to reduce the illegal logging problem but avoiding actions that would have adverse impacts on poor people and in improving the capacity of countries to monitor and segregate illegal forest products, to increase transparency and promoting policy reform. The Plan would also help producing countries improve their government capacity to prevent, detect illegal logging and to enforce the law.
- ii) Manage trade in timber, by extending international cooperation, developing a multilateral framework and a voluntary licensing scheme to attest the legality of timber that is exported to the European Union.
- iii) Guide public sector procurement to deal with legality when specifying procurement procedures.
- iv) Promote private sector initiatives to encourage actors in the corporate sector to favor good practices in the forest sector and to source only legal timber.
- v) Encourage financing and investment safeguards, aimed at banks and financial institutions that invest in the forest sector to mainstream environmental and social impact as well as explicit conformity with legislation in their operations.

Box 5.2 GATT and TBT

GATT Article 1: no import discrimination against like products from third states.

GATT Article III:4: imported products to be accorded treatment that is not less favourable than that accorded to like products of national origin.

GATT Article XI:1: no establishment of quantitative import restrictions.

GATT Article XX: exceptions to GATT rules allowed in cases when they are needed to (a) protect public morals, (b) protect human, animal or plant life or health or (d) to secure compliance with existing laws and regulations not inconsistent with the provisions of the agreement, including those (g) relating to the conservation of exhaustible natural resources if those measures are made effective in conjunction with restrictions on domestic production and consumption/

TBT Agreement Article 2.1: With respect to technical regulations, no imported products should be subject to a less favourable treatment than that accorded to like products of national origin.

TBT Agreement Article 2.2: Technical regulations should not be prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. The Article specifies that “technical regulations shall not be more trade-restrictive than necessary to fulfill a legitimate objective, taking account of the risks non-fulfillment would create. Such legitimate objectives are, inter alia: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment.

TBT Agreement, Article 2.9: Imposes publication, notification and consultation requirements on a WTO member that proposes to introduce technical regulations in an area in which relevant international standards do not exist.

The Plan focuses exclusively on the legality issue and not on sustainable forest management. It does recognize that some activities may be legal but may not lead to sustainable forest management (for example the authorized conversion of forest lands to alternative uses) or vice versa, that some activities may be illegal but could result in sustainable forest management (traditional community lands, not legally recognized as community owned, but often managed in sustainable ways). It justifies this approach by indicating that the law usually requires sustainable forest management and that therefore following legal prescriptions would result in well managed forest resources. Should this not be the case, the EU would encourage and provide support for a revision of the legal framework. The Plan recommends that all donors attach importance to community-based forest management and to addressing some of the underlying causes of illegal acts, such as land tenure and access to forest resources and facilitate the adoption of policy reforms to reduce the impact of these causes. The Plan would promote transparency and dissemination of information to the public.

Recognizing the importance of the EU as a market for exporting countries and its responsibility not only to work to stop imports of illegally sourced timber but also help exporting countries to ensure better law compliance, the Plan includes the installation of an independent and voluntary legal timber verification system. Once legal timber has been identified, partner exporting countries would voluntarily issue an export certificate without which timber would not be released for circulation within the European Union. Since wood may be exported from non-partner third countries, the Plan aims at developing a system to verify that timber imports from these countries is also legal. This would be facilitated if a regional agreement could be developed and therefore the Plan suggests constructing an agreement between the EU and the ASEAN countries as a first step in this direction.

Noting that there is no Community legislation to make it illegal to import illegally sourced wood and to impound illegally sourced wood, the Plan proposes further research on how to reverse this situation. The questions to be investigated include how such legislation may impact the work of customs services responsible for enforcing the law and the procedures to be followed for segregating illegal wood arriving into the European Union from exporting countries that do not participate in the voluntary licensing scheme including shipments from non-partner countries suspected to be of illegal origin.

The Plan also includes exhortations to EU member states to adopt policies to exclude illegally sourced wood from public procurement. The Commission also proposes to address the promotion of voluntary corporate codes of conduct. And noting that investment entities can exert a strong influence in shaping activities they finance, the Commission proposes to encourage banks and financial institutions to consider environmental and social considerations when assessing investments in the forest sector. The plan would also foster procedures for project screening, to reduce illegal forest sector activity, by Export Credit Agencies, the European Investment Bank and the Cotonou Investment Facility. The Commission plans to investigate ways to integrate illegal logging activities into the money laundering legislation.

In addition, the Plan proposes actions to strengthen the operation of CITES, carry out work to define conflict timber and address in cooperation programs the problem of using forest resources as an instrument for sustaining armed conflict. The Commission would prepare country and regional strategy papers to help plan joint activities. Focus would be kept on countries that have mustered the necessary political will to tackle illegal activities in the forest sector. Initially, the partnership agreements would cover a limited range of solid wood products (roundwood and rough sawnwood) due to the difficulties of ascertaining the origin of timber products with a more advanced degree of industrial processing.

A Joint Work Program is being prepared with Member States to facilitate the implementation of the Action Plan. Through an agreement with the Government of Indonesia the European Commission is supporting, with an €2 million contribution, the establishment of an Illegal Logging Response Centre. The Centre will build up the capacity of the Government of Indonesia to combat illegal logging, particularly in national parks and protected areas, disseminate information, provide evidence for supporting legal action against transgressors and research underlying causes of illegal activities in the sector.

Some observers have criticized the Action Plan for not securing effective participation of civil society and forest peoples in decisions that may affect them. FERN also called the attention to the fact that, in certain countries, participation of vulnerable groups may be difficult and even dangerous and suggests therefore that the Plan include measures to ensure that forest peoples views are integrated in the design of corrective actions without threatening their integrity and human rights. FERN also suggests that the EU ensure the

inclusion of illegal logging in reviews of money laundering legislation. For example, illegal logging could be listed as an offense under the Third Directive on Money Laundering in the legislative proposal that the Commission is about to submit to the Council and the Parliament, thus making it imperative for Banks to report any activity considered suspicious.

Furthermore, the Plan has been criticized because it does not provide a concrete and workable way to actually stop illegal wood from entering the EU. The Plan only promises to research this issue. The WWF pointed out that the Action Plan does not acknowledge the problems of illegal timber trade in the accession countries despite the fact that they have been openly recognized at the recent Ministerial Conference for the Protection of Forests in Europe. Based on this analysis FERN has made concrete proposals for attacking these problems (See Box below).

Despite these perceived deficiencies, the Plan is perhaps the most concrete and decisive international initiative to combat illegal logging and associated trade. Its future effectiveness will depend on the ability of the Commission to establish partnership agreements with a substantial number of producing exporting countries and thus avoid the diversion of illegal timber exported through third countries. It will also depend on the possibilities of making illegal any import of illegally sourced timber into the European Union. This implies installing credible and effective tracking systems and the necessary institutional infrastructure in partner exporting countries. Effectiveness will also require an EU tight customs system that would be able to detect and enforce prescriptions against illegally sourced products. As discussed later in the text, its effectiveness would also depend on surviving WTO disputes. These are all formidable challenges.

The Plan may also encourage exports of illegally sourced wood to other world markets that do not demand validation of product legality. Furthermore, there is always the open question of whether the simple threat of the restriction would not generate powerful short-term incentives to illegal logging by all those operators that want to export as much as possible before rules come into effect.

Understandably, in its first stages, the Action Plan focuses on solid wood products with low processing (roundwood and sawnwood), as the feasibility of tracking products with a greater degree of industrial processing having a complex mix of wood raw material inputs, is rightly judged to be low. However, this will also limit the impact of the Plan.

Box 5.3 FERN Recommendations

FERN recommends the Council to:

- provide the European Commission with a mandate to negotiate bilateral agreements to ensure legality in the trade of forest products that include certificates of legality based on a system of independently-monitored legality verification in the producer country. These agreements need to be fair and workable, include the participation of affected communities and respect human rights.
- make it illegal to import illegally-sourced timber into the EU.

In addition to new legislation FERN believes that it is important for the Council to:

- ensure mandatory application of best available environmental and social standards and procedures by European ECAs to all their operations and instruct the European Commission to develop and apply binding standards and procedures to the Cotonou Investment Facility;
- ensure all EU member states adapt their government procurement policies to incorporate legality criteria as well as sustainability criteria for timber and wood products;
- instruct the European Commission to include illegal logging in the list of offences in the draft of the new Money Laundering Directive, to be agreed within the next three years, and shift the burden of proof so that banks have to report any activity they should consider suspicious based on the information they have available;
- ensure all member states implement the EU Money Laundering Directive in such a way that banks have to report on any activity they should consider suspicious and that all criminal activities are eligible;
- instruct the European Commission to include funds for the prevention of illegal logging under the programming of Country Strategy Papers;
- request the European Commission to develop concrete strategies to address illegal logging

Although the European Union weighs heavily among importing regions of roundwood and sawnwood, these internationally traded products conform only a tiny proportion of logging in exporting countries. These countries produce some 420 million cubic meters of industrial roundwood but less than 20 million, or less than 5%, are exported. Also, they produce some 90 million cubic meters of sawnwood but only 13 million or some 14% enter the international market. Both products combined represent about \$ 6 billion in exports (total developing country forest products exports are some \$23 billion, while global trade of all forest products is about 130-140 billion per year). Total trade of forest products has increased only by 18% since 1990, which is much less than the growth in other sector manufactures. Further, exports of roundwood show a decreasing trend while those of sawnwood, only a moderate increase. Trade in ITTO primary products has in fact decreased by almost 40% since 1990, from \$13 billion to \$8 billion today¹²⁶. They accounted for 80% of total trade value in 1990 but today this proportion is only 42%.

However, these exports are concentrated on a few countries (Indonesia, Malaysia, Brazil, Gabon, and Cameroon) and therefore, should the plan manage to involve those countries from the very beginning, its impact would be greater than the numbers above may suggest. Nevertheless, the fact remains that the roots of illegalities in the forest sector are overwhelmingly a domestic economy problem and that trade can have a moderate impact only. The future importance of the Plan may reside more in the other activities that will support, such as capacity building and policy and legislative reform, in raising awareness of the problem and fostering political commitment to solutions. This, of course it is not a limitation of this scheme only, but of all initiatives that rely on managing international trade to reduce illegal logging in forest rich exporting developing countries.

¹²⁶ Plywood, sawnwood, venner, logs, furniture, moulding, woodwork, etc.

With the Plan being sent to the Council and the European Parliament, discussions will likely focus on some of these issues. The Group on Forests will formally discuss the Plan at a meeting that will take place in September 2003. During the Italian Presidency (July-December 2003), the Council is expected to produce its conclusions on the Plan.

“A resolution from the European Parliament on illegal logging remains elusive after a dismal debate at the Industry, Trade, Research and Energy (ITRE) committee on 26 November. Discussing a motion put forward by UK MEP Nicholas Clegg, the committee members delayed Parliamentary support for the FLEGT Action Plan (...) some ITRE members even tried to introduce amendments that would undermine achievements so far. For example, Finnish MEP Samuli Pojhamo sought to ensure that companies operating legally would not have to prove the legality of their operations. If accepted this would make a nonsense of the Commission's plan to develop partnership agreements - based on a licence of legality and associated chain of custody - to create a level playing field where all companies would have to comply with the same process. The ITRE discussion went from bad to worse when the MEPs decided to reopen the motion for further amendments. More positively, British and separate Commission delegations now visiting Helsinki may improve Finland's understanding of the need to respect the law and promote good governance in the forest sector, and we hope to see a better approach in the near future.

Meanwhile, before the end of 2003 the European Commission is expected to present the Council with a 'road map' laying out the steps ahead to implement the Action Plan. We hope this will be made publicly available and that a broad and effective stakeholder consultation process is included in it. (...) (Quoted from: FERN Newsletter November 2003)

Conclusions

There is a large number of international initiatives aimed at curbing illegal logging and trade in producing exporter countries. Greater awareness of the deleterious effects of illegal acts that make the achievement of traditional objectives, such as sustainable forest management, almost impossible in some producing countries, has triggered a considerable number of initiatives involving international organizations, consumer and producer country governments, international and national NGOs, consumer groups and private commercial corporations.

Greater coordination would be desirable but is probably difficult to achieve in practice. There is not much coordination between the numerous action plans and schemes to control illegal activities. A global convention or action plan to combat illegal activities in the forest sector has yet to be produced. Promoters of actions against illegal logging and trade have designed schemes that rely on bilateral agreements or on actions with a regional scope. This is due to the perception that reaching a global convention or plan of action on this politically charged and sensitive issue would probably involve lengthy negotiations and could lead to uncertain results that many believe would reduce the quality of such a convention to a minimum common denominator. CITES and CBD are global frameworks including forests but they are not geared towards controlling illegal logging. Therefore, staged approaches involving bilateral agreements and regional schemes are probably the best practical way to deal with this issue. However they have problems of their own.

The most important international initiatives originate in the industrialized world. International strategies have largely originated in the industrialized world and this has made some developing producing countries see them with apprehension. Some see activities aimed at controlling illegal logging and trade as a new non-tariff trade barrier hindering developing country producers' market access in the industrialized world. Others fear that the imposition of (developed country) values on what should be legal and what should not, would infringe on the sovereignty of producing countries that may not agree with those values. Most international schemes have gone around this problem by defining as illegal all that wood that has not been harvested, transported, processed and traded in accordance with the producing or importing country laws and regulations. Eventually, this may lead to problems: an importer country could sanction imports from a country that does not accept, in its legislative framework, some values held as desirable by the importing country or by most of the international community.

Using international trade as a tool to curb illegal logging and trade is probably useful but it is a partial remedy only. The effectiveness of the multiple international actions to curb illegal logging has yet to be demonstrated. For one thing, they are all very recent and have not had the time to fully operate and show results. Further, some of the schemes that rely mainly on managing international trade by keeping imports

of illegal wood out of the market will likely have a limited *global* impact because only a fraction of wood enters international trade. In this respect, the relative potency of trade measures is likely to be higher in Africa than in Asia or Latin America.

Because of the difficulty in monitoring the movement of products, schemes concentrate on those products whose origins are relatively easier to track because their limited degree of industrial processing, such as sawnwood. But exports of these products are a small proportion of producer countries' output.

Nevertheless, some of the main producer countries do export a substantial proportion of their production and therefore in these cases, trade influence is expected to be significant. Further most, if not all, of the international tools used to control illegal logging and trade also can be used to curb these activities in the domestic markets and therefore genuinely committed countries have a greater opportunity to increase law compliance across the board. Associated programs such as those supported to streamline the policy and legal framework, the instauration of tracking systems and the many aspects of capacity building schemes are bound to increase the level of governance of the sector overall. Thus, managing international trade can be a potential entry tool to improve governance and the efficiency of forest administration in producing countries.

Present schemes may lead to trade diversion involving countries that are less interested in curbing illegal activities. In absence of a global program to combat illegal logging and trade, regional programs and, more so, bilateral programs must face diversion of trade through third countries where wood may be laundered or simply absorbed as imports without questions asked. Some large importers are not significant participants in some of the international trade schemes aimed at combating illegal activities in the forestry sector and therefore provide alternative and less stringent markets for some operators. If, as a result of international trade controls legal wood becomes more expensive and illegal wood -- facing reduced international demand -- less expensive, unscrupulous importing markets may have an additional incentive to buy illegal wood. Thus, it seems urgent that international agreements be expanded as quickly as possible to involve a large number of participating countries, all playing by the same rules of the game. To design appropriate and specific mechanisms, it is also urgent to investigate the economic impacts of controlling measures and how they may affect the system of commercial incentives and deterrents to illegal logging and trade.

The credibility and effectiveness of international programs to control illegal logging and trade depend on sound product tracking systems. Credibility and effectiveness of methods to deny market access to products that can not be demonstrated to have legal sources depend largely on effective product tracking systems in producing countries. Product tracking systems must be successful in stopping all varieties of illegally sourced and traded wood, including laundered wood. This will be difficult to achieve. All procedures are vulnerable to "leakages" as certificates are open to fraud. The practical difficulties in segregating illegally sourced wood and illegally traded forest products make it difficult for enforcing agencies to detect and stop these products before they reach the market. Future actions will have to dedicate a great deal of attention to the establishment of credible and fraud-free systems of tracking wood products.

Further, importing countries need to put in place legislative reforms. Currently there is no legislation in major importers such as the European Union, the USA or Japan, to exclude illegally sourced wood from their markets. Without such legislation, the effectiveness of interdiction programs may be greatly diminished.

International schemes may face WTO tests but these are likely to be passed. Timber licensing mechanisms that would exclude illegally sourced wood from importing country markets may encounter challenges in the WTO. However, careful analysis suggests a WTO dispute from voluntary agreements is unlikely to be successful. Nevertheless, only a concrete WTO ruling would dispel the uncertainty surrounding this issue.

Main responsibility for combating illegal logging and trade will depend fundamentally on decisive action by producing countries. The main causes of illegal logging derive from national conditions leading to poor governance and accordingly solutions depend on a strong national political commitment, and other national actions such as policy and institutional reform. Trade restrictions will not address some of the underlying causes of illegal logging, such as imbalances in the supply and demand of industrial wood derived from policies that have fostered industrial over capacity, or the pervasive presence of corruption in the allocation of forest concessions. This is the reason for most international initiatives, even those relying

primarily on managing trade, giving attention to supporting actions against illegal logging targeted to producer country factors that induce or facilitate illegal logging such as reforms of the legislative framework and institutional strengthening. Eventually, better governance in producing countries is what will make a difference.

5.2.4 Role of Market-based Instruments and Private Sector Initiatives

Trade in Certified Forest Products and the Role of Labels

Systems for independent voluntary certification of forests as sustainably managed and of the products derived from them have been in place since the early 1990s. The most widely established certification scheme at an international level is that of the Forest Stewardship Council which extends to forests in a wide range of developing countries although over 80% of the certified forest area is in non-tropical countries (see Table 2.4). Interest in certification continues to be greatest in Europe, especially Germany, the Netherlands and the United Kingdom (Bourke 2002).

Evidence that certification is having a significant impact on forest management or on forest governance is tenuous. One reason for this is limited state involvement in the certification process, as required by FSC and WTO rules Certified forests tend to be those *already* relatively well-managed (Bass *et al.* 2001) - a reasonable level of regulatory capacity is needed for certification to be successful. Indeed, as pointed out by May (2002), the control of illegal logging is a precondition for the growth of certification. Thus, certification may only marginally benefit existing forest governance.

Three further recurrent drawbacks of certification which limit its scope are:

- Strong policies or hefty subsidies are still generally required to facilitate the participation of smaller operators;
- Proliferation of certification schemes causes producer and consumer confusion;
- Chain of custody certification remains problematic, for example with multiple source forest products, and this creates credibility problems.

Yet there are some positive examples of certification influencing forest management directly and indirectly through strengthening forest governance. The main positive governance impacts identified by reviews or evaluations of certification experiences (Bass *et al.* 2001; Eba'a Atyi and Simula 2002) relate to private or community level forest governance. They include improved forest management planning and administration (including internal monitoring, evaluation and reporting procedures), increased dialogue with government and other stakeholders, increased acceptance of community representatives in local and national policy fora, and at a more general level, increased company and supply-chain transparency.

There are also emerging examples of how certification can help stimulate enabling SFM policies (Box 5.1). These include raised awareness of the potential of SFM, decentralising and democratising the policy processes (e.g., via certification working group debates on certification and procedures, and the stimulus to multi-stakeholder forest fora), better policy definition (from agreements on certification standards), and an interdisciplinary sharing of ideas (Bass *et al.* 2001).

The process of developing national criteria, indicators and principles for SFM in South Africa has been triggered by certification discussions (Mayers *et al.* 2001). An important legal development has been to make certification mandatory within two years of leasing state forest land, so that it becomes a (cheaper) proxy to direct state monitoring of forest concessions.¹²⁷ Perhaps above all certification has intensified the profile of social issues, enabling genuine forest sector contributions into wider national debates and negotiations on labour, land rights and 'affirmative action' (Frost *et al.* 2003).

In some countries certification is beginning to take on a voluntary monitoring function of SFM; in Cameroon, Papua New Guinea and Ghana, 'privatised' chain of custody verification mechanisms are emerging which will help enforce forest management and transport regulations.

¹²⁷ Although there is a concern that this could reduce the effectiveness of voluntary market-based certification (Mayers *et al.*, 2001).

Box 5.4 Governance benefits from certification in Latin America

Much of the more positive developing country certification experience is emerging from Latin America, particularly Bolivia, Mexico, Guatemala, Brazil and Costa Rica. In the former three countries the benefits are felt especially in the community forestry sector. The key to the growth of certification has been enabling policy and institutional (including land tenure) reforms preceding or accompanying certification. In Bolivia, for example, the 1996 forest law and the more vigorous monitoring of forest management plans by the *Superintendencia Forestal* has created incentives for certification by (a) showing the seriousness of forest management plans, and (b) making certified forests exempt from government audits (Contreras and Vargas 2002). Legislation has also provided strong incentives for certification in Guatemala, where certification within three years is a condition of community concessions in the Mayan Biosphere Reserve (Bass *et al.* 2001).

In Brazil, the governance benefits from Brazilian plantation sector certification include provision for the resolution of land tenure disputes linked to outsourcing arrangements, and development of a set of national standards for certification of forest management and chain of custody systems (CERFLOR) (May 2002). Brazil now has a buyers' group of about 70 companies, spanning a wide range of forest products, supplying both the domestic and export market.

Governance, Institutional Change and Societal Processes

Chapters and Sections:

- 6. Interface of Trade and Forest Governance**
 - 6.2 Trade and Governance: Definitions and Problematique**
 - 6.2 Conflicts of Values in Debates on the Trade-SFM Nexus**
 - 6.3 Actors and their Perspectives: The Basis for Forest Governance**
 - 6.4 Governance Dynamics and Linkages Between Trade and SFM**
 - 6.5 How to Harness Trade to Create Enabling Environment for SFM?**
 - 6.6 Conclusions on Trade, Governance and SFM Interface**

6. Interface of Trade and Forest Governance

The purpose of this chapter is to analyse the governance interface between the trade in forest products and services and SFM looking for possible ways of improving co-ordination and coherence. The chapter focuses on two forms of causality between forest governance and trade: policies and institutions determine and influence patterns of trade, whilst the scale and dynamics of trade can influence the nature and quality of forest governance and thus SFM. In most situations both forms of causality can be expected and have measurable impacts on the quality and scale of sustainability of forest management.

6.1 Trade and Governance: Definitions and Problematique

Governance: an evolving concept

In the international development dialogue, the concept of governance has evolved from “public sector management, accountability, the legal framework for development and information and transparency” (WB 1992) towards a much wider definition, including a broad set of actors and formal and informal structures. The World Bank Institute currently defines governance as: “the traditions and institutions by which authority in a country is exercised for common good”.

This includes:

- the process by which those in authority are selected, monitored and replaced,
- the capacity of the government to effectively manage its resources and implement sound policies, and
- the respect of citizens and the state for the institutions that govern economic and social interactions among them.

(WBI 2003)

The Governance Working Group of the International Institute of Administrative Sciences (IIAS1996) gives an even more explicit role to the civil society in governance with the following definitions:

- Governance refers to the process whereby elements in society wield power and authority, and influence and enact policies and decisions concerning public life, and economic and social development.
- Governance is a broader notion than government, whose principal elements include the constitution, legislature, executive and judiciary. Governance involves interaction between these formal institutions and those of civil society.
- Governance has no automatic normative connotation. However, typical criteria for assessing governance in a particular context might include the degree of legitimacy, representativeness, popular accountability and efficiency with which public affairs are conducted.

UNDP defines governance as “the exercise of political, economic and administrative authority to manage a society's affairs. While the economic, political and administrative aspects of governance are often the focus, the summits and international conferences sponsored by the UN over the last decade reflect a growing recognition of the need for a more holistic concept. Governance comprises the mechanisms, processes and institutions through which collective decisions are made and implemented, citizens, groups and communities pursue their visions, articulate their interests, exercise their legal rights, meet their obligations and mediate their differences. Governance, as defined in this manner, emphasises the nature and quality of interactions among social actors and between social actors and the state”.

(<http://magnet.undp.org>)

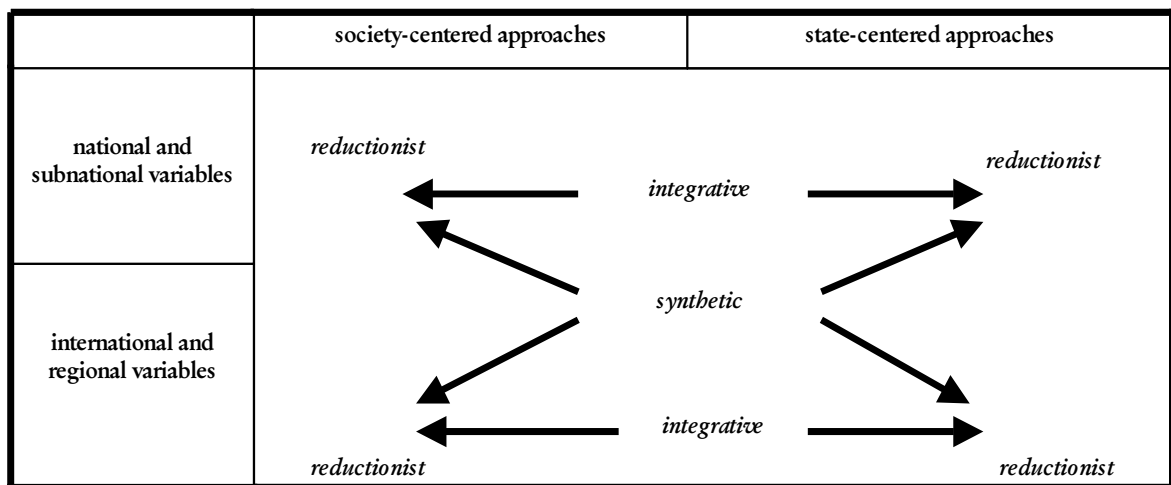
In summary, current definitions of governance are based on the recognition that governments are not the only actors in governance, but that a wide range of other societal interest groups and actors have an important role to play in decision making structures. They are also related to the wider discussion on principles on democratic decision-making, rule of law and respect for varying interests within a given society.

Discussions on forest governance tend to focus either on the local/national or regional/international levels. At the national level, the analysis is often limited either to state-centric or (civil) society centric issues. Basically three different approaches can be identified:

- (i) *reductionist approaches*, that focus on either internal, external, society- or state-centric variables exclusively;
- (ii) *integrative approaches*, that still separate internal and external perspectives but which attempt to integrate society- and state-centric strategies,
- (iii) *synthetic approaches*, which attempt to unravel the divide between internal and external factors as well as the reduction to either public or private actors (Albrecht and Obser 2003).

An attempt is made in this chapter to look at the trade, governance, SFM impacts and interactions in as much of a “synthetic” way as the available knowledge permits i.e. integrating local/national, regional/international variables, and looking at both society-centred and state-centred governance mechanisms and responses (Figure 6.1).

Figure 6.1 Conceptual model to analyse complex global governance issues that incorporates public and private actors



Source: Grande and Risse, 2000

Due to the local/national and regional/international dimensions of forest governance, addressing trade-related impacts to SFM is a shared responsibility of both forest product/service producing and consuming countries. At the same time it is obvious that the main responsibility is at the national level: sovereign countries have the right and responsibility to govern their natural resources. Action at the international level is needed primarily to create the preconditions for and support to effective forest sector governance at the national level.

Trade and Governance: What is at stake?

The conventional trade theory predicts mutual economic benefits from trade to both trading partners. However, three types of problems tend to be present in any trade scenario:

- (i) unanticipated levels of benefits and costs due to market imperfections,
- (ii) inequitable distribution of those benefits and costs, and
- (iii) disputed values ascribed to different types of benefits and costs, especially as regards market and non-market values.

These problems impact on forest products trade perhaps more than that of many other sectors, due to the characteristics of the sector: long time scales of production, extensive land-use impacts affecting other land-use options, and multiple products and services associated with forests. These characteristics also greatly increase the numbers of groups with a stake in SFM, and the relative importance that these problems are given, and consequent solutions proposed, depend inevitably on the agenda of the interest group that perceives them.

Some of the more common trade debates that spill into the forest sector include the following:

- *Mutual gains or winners and losers?* Does free trade in the forest sector lead to benefits for all or do some groups lose out?
- *Intensifying competition or increasing market power?* Is the predominance of trade through transnationals in the forest sector leading to greater competition and more efficient production or is it allowing companies to exercise market power?
- *Rising returns or deteriorating terms?* Have the historic differences between developing and developed countries in the forest sector led to a decline in the terms of trade for the former and a widening gap between the two country groupings? What responses in terms of governance are needed by governments and civil societies as a whole to address changes in the terms of forest products trade?
- *Free choice or international conditionality?* Is there evidence that forest trade liberalisation is adopted voluntarily by countries, or are countries persuaded by the international momentum of trade liberalisation without appropriate adaptation of the existing systems of governance as to safeguard national interests?
- *Rise to integrity or slide to corruption?* Is there evidence that trade liberalisation has led to improved governance to foster SFM and to increase compliance with the law (e.g. combat corruption and decrease illegality in the forest sector). Or is it implemented without major changes in the governance structure, giving rise to worsening the situation in the forest sector?
- *Wealth first or sustainability first?* Is there evidence that, in meeting international demand through liberalised forest products trade, that social and environmental externalities are addressed, or is the reverse the case?

When dealing with such complex issues, it is vital to adopt a pluralist perspective – one that recognises multiple and potentially irreconcilable interests associated with forest products trade and trade in environmental services. It is also important to acknowledge the validity of different value systems and perspectives on trade impacts. Just as SFM itself requires a negotiated coordination between multiple different societal groupings, equally trade impacts on SFM cannot be adequately assessed without taking into account the many valid perspectives on forests and trade, and the interaction between the different interest groups involved in this debate. What to one might be a great increase in national efficiency might to another be the loss of their environment and livelihood. It is less a question of whose view is right and more an issue of whose view counts – which becomes particularly problematic when there are major differences in power between the advocates of different views.

The outcome of trade debates is currently decided more by the relative power of interest groups than by the strength of their arguments. Hence this debate and its outcomes are related to governance structures both in countries and at the international level. Unfortunately trade and forest debates at both levels tend to have little convergence and co-ordination. They are commonly carried out separately, by different interest groups within different governance structures and without much systematic analysis of the impacts of one on the other.

It is also recognised that trade impacts on SFM are largely defined by the comparative values of forestland, agricultural land and property right functions - not by the value of forest resources in isolation. In many cases revisions in distorted agricultural trade policies or improved regional development policies will have greater beneficial impacts on SFM than forest or forest trade policies. Due to their extreme complexity, these wider governance issues and linkages are, however, only addressed to a limited degree.

6.2 Conflicts of Values in Debates on the Trade-SFM Nexus

Given the array of interest groups involved in the trade–SFM debate, each with its own agenda and perspective, it is not surprising to encounter conflict lines based on strong differences of opinion and objectives. Arguments about the impact of trade on forest management are part of a broader debate about the impacts of globalisation and trade liberalisation on the environment and on the development prospects, in particular of developing countries and countries in transition. These include disagreements on what impacts trade liberalisation might have, e.g. disputes over facts and their interpretation on the promotion of economic growth as well as disputes over societal values.

From a sociological point of view, it is evident that these diverging views and interests do not necessarily result in public - or in any other way transparent disputes and/or negotiations between different societal groups and/or governments.

These debates between interest groups and/or governments can be roughly grouped under three main themes: economic, social and political, and environmental. It is, however, ever more paramount that such categorization does not reflect the common overlap of interests driving the agendas and the respective actions of societal interest groups and governments.

6.2.1 Major issues at stake

Mutual gains or winners and losers?

The standard economic arguments for the benefits of trade, and hence trade liberalisation, hinge on the opportunities for countries to specialise in activities in which they have a comparative advantage and to import products for which they have a comparative disadvantage. The theory of comparative advantage is based on differences in the relative abundance and hence relative price of factors of production (land, labour and capital). Countries that have an abundance of labour relative to capital might be expected to gain by exporting goods that are labour intensive in production and by importing capital intensive goods. Opening up trade should allow goods and services to be produced in the most efficient way possible as given by relative factor endowments. Differences between countries in consumer preferences should also provide opportunities for gains from trade. In addition to these static effects there are also dynamic efficiency effects through the ability to exploit economies of scale as the market is broadened, through increased intensity of competition as trade is liberalised and through stimulus to technological innovation. For these reasons, trade is considered to result in or at least contribute to higher rates of long-term growth. (Bourgignon *et al.* 2002). However, the fact that growth in world trade has greatly exceeded growth in world real GDP over the last two decades is widely cited (eg; McGuirk 2002).

Estimates at a global level of the potential gains from trade, by eliminating remaining trade barriers, range between US\$ 80 billion and US\$ 500 billion per year with 40% to 60% of this accruing to developing countries (WTO 2003). This is comparable in magnitude to the value of development assistance that such countries currently receive. Studies of trade liberalisation in the forest sector have concluded that world exports of forest products would increase as a result of tariff reductions but that the overall impact would be quite modest (Barbier 1999; Sedjo and Simpson 1999; USTR 1999). This reflects the fact that tariffs in the forest sector have historically been low relative to other sectors. While there is private sector support, for reducing tariffs further in the forest products sector, it is recognised that other aspects of liberalisation are important. The position of the Confederation of European Paper Industries (CEPI) for example, is that new issues such as trade and environment and multilateral rules for competition and investment will have a much greater influence on future trade than tariffs (CEPI 2000).

Critics of these economic arguments, while in some cases acknowledging efficiency gains from trade, point to the inequality in the distribution of the gains from liberalisation, both between and within countries. This to some extent has been accepted by proponents of free trade who, while stressing that economic growth can raise average income levels, acknowledge that policy changes associated with greater openness to trade will cause changes in distribution, some of which may impact on the poor. But it is claimed that whether this happens is an empirical question and not an automatic outcome of trade liberalisation (Bourgignon *et al.* 2002).

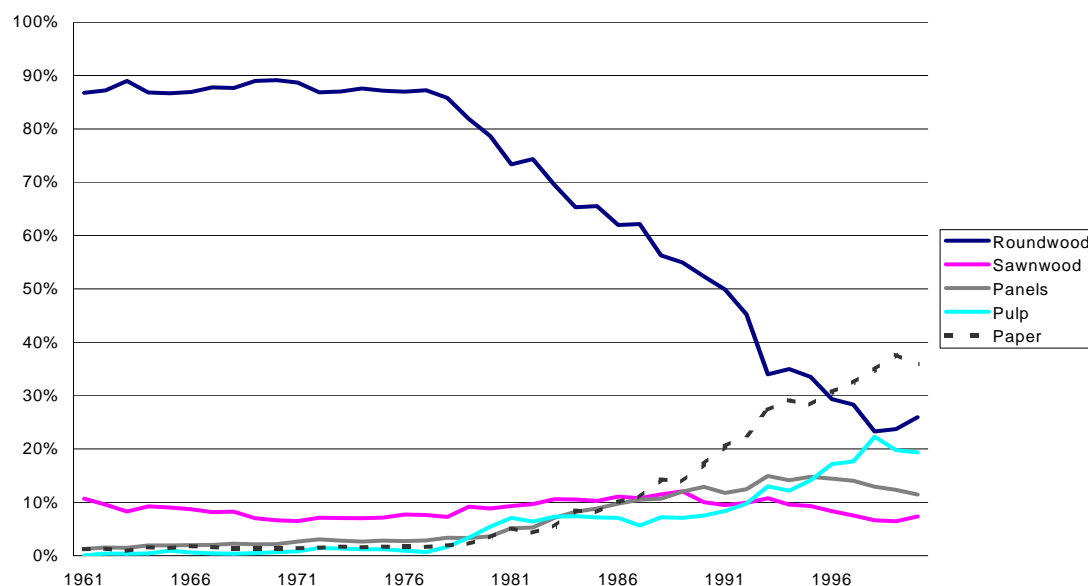
In the forest sector, the studies of tariff reductions referred to above estimated that trade liberalisation was likely to have most impact on production and export levels of developed countries but did not suggest that developing country producers would be adversely affected. Concerns about distributional effects of trade liberalisation in the forest sector have focused more on indirect impacts at the country level, and the impetus given by forest sector expansion to encroachment on land held by local communities. The World Bank in its revised Forest Strategy notes that more liberal trade under current circumstances of widespread market failures, is likely to exacerbate the undesirable impacts of globalisation and market liberalisation in the forest and other industrial sectors on forest-dependant local communities (World Bank 2001 p 25).

Rising returns or deteriorating terms?

A long-standing argument against free trade associated with Raul Prebisch is that over time because of structural differences between developed and developing countries, there is a decline in the terms of trade between primary commodities and manufactured goods. This reflects a number of factors but primarily differences in the income elasticity of demand. Demand for primary commodities tends not to keep pace with rises in income while in contrast that for manufactured goods increases. Another factor is that labour markets in developing countries are more competitive because of the availability of a reserve labour force from the subsistence agriculture sector. Benefits of productivity gains would be transferred to purchasers in developed countries in the form of lower prices rather than increasing the returns of production in developing countries. For these reasons it is argued, irrespective of differences in productivity, developed countries will always import products comparatively cheaply and export products at a comparatively higher cost than developing countries (Edwards 1985). This argument prompted much of the import substitution activity and associated trade protection in developing countries, particularly in Latin America in the 1960s and 1970s.

Some developing countries however, have managed to move into export of manufactured goods and it appears that this shift accelerated after moves towards economic liberalisation. Between 1980 and 1998 the share of manufactures in the exports of developing countries increased from 25% to 80% (World Bank 2002). Similar trends are evident in the forest sector. As shown below in Figure XX, tropical countries and by implication developing countries, have been increasing the share of value-added products in their exports of forest products. It is argued, however, that this success can not be attributed to the overall trade liberalisation, but reflects the impact of log export bans and assistance to the forest industry. Some major forest-rich countries have lifted existing log export bans and decreased subsidies to infrastructure, local manufacturing and exports through tax cuts and other fiscal measures resulting in increased pressure in commodity exports and thus increased logging. Other countries have actively supported the establishment of forest resources in the form of forest plantations as to substitute the loss in income from natural forests.

Figure 6.2 Composition of exports from tropical countries, 1961–2000:



The enormous decrease in roundwood exports from tropical countries over the past 40 years has not resulted in an equally high increase of exports in value-added products. While the important domestic trade in value-added products certainly plays an increasingly important role in GDP development, export earnings from forest products seem again to start increasing by (mainly) tropical hardwood logs, square logs and sawn timber, in particular to emerging markets such as China (FAOSTAT 2003; China Market Review). Consequently, concerns about declining terms of trade for developing country producers still persist but the primary cause for this is perceived now as the concentration of market power amongst international buyers, including those transnational companies being equally involved as forest concessionaires in developing countries.

Intensifying competition or increasing market power?

One of the beneficial effects often claimed for trade liberalisation is that it opens up domestic markets to international competition and thus reduces the likelihood of monopoly power on the part of local firms (World Bank 2002). But it is also acknowledged that increasing trade openness coupled with investment liberalisation can lead to sectors being dominated at a global level by just a few players. Removing distortions such as trade and investment restrictions could speed up the process of market concentration.

Opponents of liberalisation in the forest products trade point to the increasingly exclusive relationships between transnationals and their subsidiaries, arguing that opening up the economy in relation to both trade and investment will increase the vulnerability of producer countries to the interests of important buyers. Concern is expressed that the percentage of world forest product trade controlled by transnationals is as high as 80-90%. Interest groups also highlight the recent mergers between large paper companies, for example between Stora and Enso and International Paper and Champion International (Rice *et al* 2001). However, in recent years, the change in industrial structure has come to a halt.

At a national level, consolidation in the forest products sector has also been advanced. In Indonesia, for example, the top ten timber companies recently held 47% of the total forest concession allocation, amounting to 24 million hectares – more than one fifth of the total Indonesian forest area (Forest Watch Indonesia 2002).

There is some scepticism about the potential advantages of such industrial consolidation. There is concern that the growing influence of the consolidated industrial structure having increased their size and market share will increase the demand for the commodity of roundwood, rather than value-added forest products and thus contribute to forest destruction (Gregory *et al.* 2000). Implicit in this concern is the fear that any economic gains from trade liberalisation will be captured by large companies rather than bringing increased benefits to local communities, landholders or governments. Furthermore, Rice *et al* (2001) point out that most of the new investments in the forestry sector between 1996 and 1998 were in a selected number of countries suggesting that it is not only abundant wood fibre supplies and an overall favourable investment climate, but also less stringent environmental regulations and low cost of labour that make these countries attractive locations for investors.

With regard to the dimension of governance, the interactions between the current industrial structure, local communities in their access to the forest resource and governments being responsible for policy making, law enforcement and operational support to SFM through appropriate strategies need clarification, adaptation and consolidation. In many countries, the aforementioned developments have not sufficiently counteracted to avoid or to decrease negative impacts and thus resulting in major disputes and even subversive actions by different interest groups.

Rise to integrity or slide to corruption?

Non-economic advantages of free trade are also widely advocated and economic integration seen as a powerful force against oppression, corruption and illegality and as a contributor to world peace and stability (e.g. by the IMF). An open trade regime might mean that there will be less temptation to circumvent restrictions through corrupt or illegal activity. The opposing view is that the competitive pressures implied by free trade increases the temptation for companies to cut costs through illegal activities in order to compete.

This has been a key issue in the forest sector where the debate is about whether trade has a neutral effect on governance or tends to undermine it. It is a widespread view that trade on its own does not cause forest degradation but that if combined with poor forest management and weak governance it will aggravate the situation, leading to a wide range of adverse environmental and social impacts.

A somewhat different view is given by Ross (2001) who argues from a political science perspective that the problem is not so much that trade takes place in contexts of poor forest governance but that it sets off processes that undermine good governance systems. The windfall rents from export booms lead to rent-seeking pressure from different sectors of society who want a share of the rents and to a process of rent-seizing by which state actors dismantle institutions that restrain their ability to allocate rents e.g. by

reducing powers of forest management authorities. Thus Ross concludes that the international trade in timber, particularly tropical timber is a serious threat to many remaining forests and that studies such as the one prepared for ITTO in the early 1990s (Barbier *et al.* 1994) have underestimated the damage done by the expanded timber trade. While international trade may be small in relation to domestic trade, the weakening effect it has on forestry institutions, once rent seeking and rent seizing are set off can affect the whole forest sector.

Free choice or international conditionality?

Linked to this is the widespread view that trade liberalisation is not entered into willingly by developing countries but that countries were persuaded to adopt the free-trade doctrine by international financial institutions. Thus it is not necessarily a national preference that makes governments select policies with a strong focus on free trade, balanced budgets, moderate taxes; rather, these policies are the result of the enormous differences in the power between the international financing institutions, especially the IMF, and their client countries which stifle any discussion about alternative economic policies (e.g. Stieglitz 2002). These developments are not related specifically to trade liberalisation of forest products, rather the concern is about the reduction in the overall priority given to environmental and social issues as a result of a liberal agenda. The negative impacts of World Bank lending and IMF-supported structural adjustment programmes on the forestry sector have been analysed in various World Bank evaluations resulting in a carefully crafted new Forest Strategy and Operational Policy on Forests (World Bank 2002)

A second criticism that is made by some economists (eg Stiglitz 2002 and Helleiner 2000) focuses on unequal power relations in the formulation, interpretation and enforcement of trade rules. While developing countries are urged to eliminate tariff barriers and more generally to liberalise their economies, developed countries maintain subsidies and trade restrictions, thus restricting market access for developing countries. According to this view, many developing countries lack the financial or political clout required to implement or to influence the development of trade rules in their favour. A number of social development NGOs such as Oxfam are now advocating trade liberalisation but focused on developed countries as a means to promote market access for developing countries. The forest sector, although relatively liberalised, still shows strong evidence of tariff escalation with developed countries and countries with economies in transition like China generally imposing higher tariffs for processed products (Rice *et al.* 2000).

Environmental efficiency or environmental exhaustion?

The impact of trade on the environment is equally controversial. Economists drawing from standard trade theory argue that trade liberalisation may have positive effects on the environment. They see environmental endowments as a factor of production, leading to the conclusion that countries with a relative abundance of such endowments, whether natural resources used as inputs in production or assimilative capacity, will specialise in goods that are intensive in the use of such endowments (Johnstone 1996). Through specialisation, trade will lead to goods being produced in ways that minimises the use of factors of production including the environmental factor. Conversely, restrictions on trade will imply that greater levels of resource use and environmental damage will be needed to produce the same level of global output than under a free trading regime.

However, it is acknowledged that trade liberalisation could have an adverse environmental impact through its impact on the scale of production. Trade insofar as it leads to economic growth and an increase in productive activity will result in more use of environmental factors whether natural resources or pollutant assimilative capacity.

For this reason attempts to reduce tariffs on forest products and so increase trade are regarded with some concern. There was an intensive discussion about the impacts of the Accelerated Tariff Liberalisation (ATL) initiative which proposed for eight sectors, including forest products, further reductions and acceleration in the timing of tariff reductions agreed to as part of the Uruguay Round. An assessment by USTR estimated that the global effects of ATL would not be significant, increasing forest products trade by 2% and timber harvest by only 0.5% by 2010 (USTR 1999). More importantly, USTR predicted that the environmental impact would be small as it would reinforce trends towards timber harvest based on

plantations and intensive management of secondary forest. One response to this analysis and to tariff liberalisation in general as typified by Rice *et al.* 2001 is to acknowledge that tariffs in the forest sector are already low so that liberalisation through tariff reduction will have little global impact on forests. However, some environmental interest groups continue to be concerned about the possible pressure this might cause on remaining forests, in high volume export countries in particular, where large increases in timber harvest can be expected following tariff liberalisation. Rice *et al.* go on to propose tariff reduction should be approached more carefully analysing the environmental impacts and the impacts on sustainable development as to design effective and appropriate policies and legislation.

Most analysts agree on the link between economic growth and environmental use – the area of disagreement is over the extent to which the scale effects are offset by other potentially positive factors such as changes in sectoral composition and technology as well as more indirect factors such as increased environmental awareness and enforcement of regulation, which affect the demand for environmental quality (Nordström and Vaughan 1999). Trade may play a role in facilitating these positive offsetting effects. In particular, it is argued that trade can have beneficial environmental effects through its influence on the production technologies used, thus offsetting the adverse effects of increased output. Firms may be able to import cleaner technology because of lifting of trade restrictions, or through economies of scale may be able to invest in more efficient production processes which are likely to be environment-friendly, or may be exposed to foreign patterns of demand that are more concerned about the environmental impacts of production (Johnstone 1996).

Based on the strength of these offsetting factors, and a view that rising incomes will increase the resources available for investment in environmental improvement, some economists have suggested that there is an inverted u-shaped relationship between income and environmental damage (the so-called “environmental Kuznets curve” or EKC), such that environmental damages incurred during early phases of economic development are subsequently rectified at later stages – environmental degradation per unit of output rises with income levels until a certain level is reached and then begins to fall (Beckerman 1992; Bhagwati 1993; Panayotou 1993; Stern 1998). This would imply that expanding trade, in spite of its impact on the level of economic activity would eventually be associated with environmental improvement.

There is some empirical evidence in support of the environmental Kuznets curve but this is strongest for localised effects such as particulate emissions and weakest for effects such as CO₂ emissions which are externalisable or diffuse (Johnstone 1996). EKC studies which have looked at the relationship between income levels and deforestation have generally been inconclusive (Kaimowitz and Angelsen 1998). An analysis of some 120 models linking deforestation to its causes has shown that higher national per capita income is associated with greater deforestation in developing countries. Results regarding the impact of rapid economic growth on deforestation are contradictory, and to be treated with caution since they are based on global regression analyses with poor data (Kaimowitz and Angelsen 1998).

There has been considerable criticism of these empirical studies and of the EKC concept, the main arguments being that empirical evidence is weak, often applying only to some indicators but not others, statistical techniques used are inappropriate and that dynamic effects are not captured well (Stern 2002). There is particular concern that the EKC takes no account of irreversible effects such as biodiversity loss (Tisdell 2001). Moreover, while the EKC relationship may hold in developed countries, this may only be at the expense of an increasing “environmental footprint” on the global commons and on the developing countries (Daly, 1991, Andersson and Lindroth 2001).

Even if a strong relationship can be found between rising income and deforestation, this does not necessarily imply that expansion of international trade in forest products is the main contributing factor. A study for the ITTO on the tropical timber trade (Barbier *et al.* 1994) concluded that international trade was not a major source of tropical deforestation given that it represented only 6 per cent of total tropical non-coniferous roundwood production. This proportion has changed little since then.

Moreover, the same study reviewed the various statistical analyses of the linkages between industrial roundwood production and deforestation and concluded that the evidence was limited. A more significant threat was the conversion of forests to other uses such as agriculture. At the time this conclusion was considered by some analysts (eg Dudley *et al.* 1996) to be playing down the effects of the timber industry and international trade on the quality of forests. They pointed out the shortcomings of timber statistics in for example not addressing illegal logging and the fact that industrial logging was often a catalyst for subsequent agricultural conversion and human settlement because it opened up access to a forest area.

There is recognition that the expansion of horticultural plantations (such as palm oil, sugar, soya etc) represents one of the main causes of forest loss (Rice *et al.* 2001). Therefore, the argument that international trade in forest products is not the main driver of unsustainable forest management has since been accepted widely for both tropical and non-tropical timber and the debate has shifted to the conditions under which trade takes place and its differential impact on countries and products.

A reflection of this view is given in the report of the Committee of Trade and Environment (CTE) of the WTO to the Ministerial Meeting in Cancun (WTO, 2003). It outlines the view of member states that trade liberalisation and sustainable forest management do not constitute contradictory approaches, but are mutually supportive.

Pollution havens and regulatory chill

An alternative view to that of the standard economist approach is that countries will specialise in resource-intensive and environmentally damaging activities not so much because of differences in natural endowments but because of differences in the stringency of environmental regulation. It is argued that countries will compete for exports and inward investment by making environmental and social standards less stringent, the so-called regulatory race to the bottom or eco- and social dumping.

Countries thus derive comparative advantage from their choices about environmental regulation. The empirical evidence for this relates more to inward investment than trade and is weak, the conclusion being that other factors such as macroeconomic stability, market size and growth potential, availability of infrastructure and trainable labour are more important than environmental standards in influencing the location decisions of companies (Oman 2001).

A modification of this argument is that while countries will not necessarily weaken their existing standards, there will be a “regulatory chill” effect on further environmental and social improvements for fear of capital flight or loss of competitive advantage (Esty 2002). Evidence for this is also weak and attention has focused most on greenhouse gas emissions and air pollution (Neumayer 2002).

For the forest sector however, a number of authors take the view that the trade expansion in certain countries reflects not comparative advantage based on natural resource endowments but “undesirable comparative advantage” reflecting inadequate forest policy, poor enforcement in relation to environment, tax payment, treatment of local communities and employees as well as subsidies through tax breaks and infrastructure support. This raises the issue of how legitimate comparative advantage is determined and is closely linked to the system of forest governance.

The response often made to these ecological and social dumping arguments is that a country’s environmental endowment is socially as well as physically defined, reflecting local preferences for environmental quality as well as natural endowments (Johnstone 1996). The implication is that comparative advantage stemming from differences in the stringency of environmental regulations may be quite legitimate. For this reason measures proposed by environmentalists such as attempts to harmonise standards, to restrict trade or to make it conditional on minimum standards being met or to integrate environment in trade negotiations have been regarded with suspicion by developing countries governments, concerned about green protectionism (Shahin 2002). As a result developing countries tend to perceive environment as a developed country interest and as something to be bargained over in order to obtain concessions in return (Tarasofsky 2001).

The view typical of most economists and international financial institutions is that environmental problems or sources of market failure can best be tackled with environmental policies that address these issues directly and that trade restrictions are not the best option (eg: Nordström and Vaughan 1999, Irwin 2002 World Bank 2002). This is particularly the case where environmental problems are local. In the case of global environmental problems such as biodiversity loss and climate change, international cooperative action is favoured.

For the forest sector though the issue is whether trade rules will interfere with domestic environmental policies. There is general agreement that changes in non-tariff measures could have a much greater impact than tariff reduction (Rice *et al.* 2001; Sizer *et al.* 1999). The main concern is that the definition of NTMs has been broadened so much that any aspect of policy or practice in one country that discriminates against another could be considered an NTM even if not deliberate. Sizer *et al.* 1999 refer to over-inclusive

definitions of trade barriers that would involve removing domestic environmental measures and that the “overzealous application of trade liberalisation rules to remove perceived trade barriers can interfere with efforts to protect forests”.

6.2.2 Key areas of conflict and convergence

There is general acknowledgement that tariffs on forest products are low relative to other sectors and hence that non-tariff measures have greater relevance. The extent to which non-tariff measures can be used legitimately to achieve the agendas of different stakeholders is a major issue, reflecting differences in opinion over what can be considered as trade-related. There is concern that trade rules are limiting forest policies that are essential to create an enabling environment for SFM.

It is increasingly recognised that the international timber trade is not the major driver of forest clearance, although its impact on forest degradation is less clear. Policies in other sectors that compete for forestland use are as important as policies related to the forest sector. To assess the impact of international trade and trade policy on forest management it is necessary to understand these extra-sectoral influences.

The focus of the debate is *inter alia* shifting from trade *per se* to the overall investment conditions which drive it. Will the increasing presence of transnational companies in the forest products sector lead to greater efficiency or will it lead to large companies making profitable use of weak forest governance and undermining systems of environmental control? Will the distribution of economic benefits from trade liberalisation be captured mainly by investors rather than by landholders or governments? While some investors identify environmental and social campaigning as an investment risk, others join initiatives of “socially responsible investments” or “codes on conduct” in support of SFM.

There are diverging views on how to achieve the environmental and social safeguards which would guarantee SFM in the countries’ overall context. International pressure through MEA and international finance institutions like the World Bank, initiatives to address illegal logging and trade like FLEGT, NGO involvement in international cooperation through ODA and other sources as well as NGO campaigns in consumer countries are not only confrontational, but have led to major improvements in policy making and operations on the ground. However, one of the major issues involved in the current developments is the dimension of national sovereignty and national responsibility in managing natural resources leading to an important discussion on governance and the distribution of roles and mandates, in particular in poor governance situations. In this regard, forest certification and forest product labelling play a major role, even though their position vis-à-vis forest policy remains unclear.

6.3 Actors and Their Perspectives: The Basis for Forest Governance

6.3.1 Background: Complexity of Stakeholder Involvement

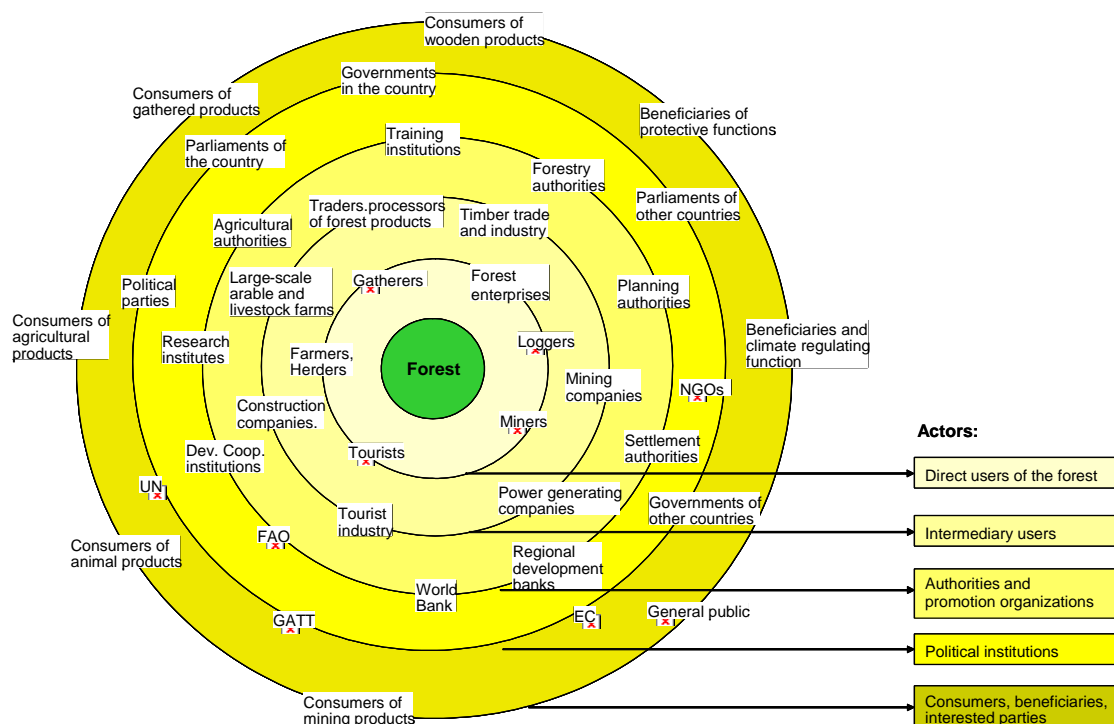
Forest products’ trade touches directly and indirectly on numerous societal groupings both within and outside the forest sector. In assessing the impact of trade policy on SFM it is vital to engage with major societal groupings on trade and understand their many diverse perspectives on forest trade. From a sociological perspective, societal dynamics have accelerated in the recent past with increased economic opening of societies and increased mobility. Trade liberalisation and the focus on world markets rather than domestic markets have further supported this acceleration leading to rapidly changing perspectives of stakeholders, interest groups and their networking. Similarly, the international community and international environmental and social policies have greatly impacted on societal dynamics and the establishment of new pressure groups. The economic interests of these groups are not concerned with forest products, but focus on forest services that have created an important niche at least in the “development marketplace”.

The major types of societal groupings involved in SFM in the forestry sector are presented in Figure 6.3. to illustrate the complexity of the situation. The figure shows that major interests in forest management and trade in forest products and services go far beyond the traditional forestry sector.

Even though such interests are generally being addressed in various analytic studies and policy processes, mutual understanding, effective conflict management and consensus-oriented decision making have been

widely lacking. Inappropriate transparency, insufficient information flow and lack of relevant forums for policy making, planning and evaluation limit the potentials to jointly work towards SFM. In particular, trade-related issues have not yet been on the agenda of the forestry sector in a way that would allow addressing the trade-SFM nexus effectively.

Figure 6.3 Major Societal Groupings involved in SFM and Trade



Source: Burger and Mayer, 2004

This section represents an attempt to provide an overview of the societal groupings, stakeholder institutions and government as well as the international community and their networking. The analysis should provide the foundation for the discussion on governance issues based on the discussion of conflicts and convergence of values. This helps to understand the alliances and conflict lines surrounding trade in forest product and services - as well as identifying the key targets for a balanced and constructive empowerment in trade discussions and the key audiences for advocacy towards policies which foster SFM.

6.3.2 Societal Groupings and Their Networking

Inevitably, any attempt to characterise societal groupings is open to accusations about:

- (i) the extent to which the categories capture groups that matter – or include those that don't (legitimacy);
- (ii) the degree to which different categories can be distinguished (overlap);
- (iii) the characterisation of the perspectives within any group (attribution);
- (iv) the weight that any group's opinion should have (representation).

In summarising and simplifying the above Figure 6.3, a checklist of societal groupings that have influence over and an interest in trade and forest policy or are influenced by it might be expected to include at least the following:

- Parliamentarians and government officials in trade and forestry-related domains, including forest authorities at all levels
- Public and private investors / financiers in forests, including transnational timber companies
- International Development Banks and UN Development Agencies
- Bilateral Donor Agencies and international NGOs, including church groups
- National timber production and NWFP enterprises
- International/national forest industry (processing)
- Environmental alliances/interest groups/NGOs (national networking)
- Social development alliances/interest groups /NGOs (national networking)
- Consumers of forest products and services
- Research community
- Local communities at the forest-agriculture interface
- Forest-based indigenous communities

In order to elaborate on this checklist of societal groupings, emphasis is laid on their interests and interactions rather than on details of their roles and mandates, which should be common knowledge. Each of these societal groupings is likely to display differences in perspective on policies on trade and forestry, but the analysis should not be limited to the description of their interests. Since some groupings are more likely than others to have the power to enforce their point of view, the positioning of each group in the societal context will determine the approaches to improved governance. It is certain that this positioning and its inherent dynamics vary from country to country and from region to region. However, some major similarities are subject to theory building and to the identification of basic elements for effective strategies to address improved governance.

It is evident that there is little correlation between a group's degree of influence over trade policy and its dependence on the forest in terms of subsistence and/or sustainable livelihoods in a rural context. Indeed, some societal groupings are often not really 'actors' or 'protagonists' in the debate over trade in forest products and services, but spectators or marginalised groups who find difficulties in expressing their views and interests in an appropriate way. Numerous efforts have been made in the context of general decentralisation, local Agenda 21 efforts, development projects and in particular in Poverty Reduction Strategies (PRSPs) to change the current situation and many interesting results and experiences have been reported. However, while existing anthropological and sociological analysis gives broad evidence of the necessity to involve currently less powerful societal groupings, the practical implications of good intentions have been insufficient at large.

While *government officials* are acting as trade negotiators in global and regional processes, recent world-wide research results (CPOGG, 2003) show that national parliaments and consequently *parliamentarians* are insufficiently involved in the decision-making processes, including the elaboration of national positions. This adds to the impression that any agreement on trade liberalisation is the result of negotiations between the government and international institutions and processes, rather than an expression of national interests deriving from an open debate within democratic institutions. However, despite international pressure, developing country representatives often reject the notion, pace or equity of further liberalisation, using structural or under-development arguments in economic debates on free trade.

Forest authorities often play a major role in enforcing tariff and non-tariff barriers to forest trade, but usually have a weak political status and are rarely included in the definition of forest trade policy. The perspective of forest authorities will be shaped by the extent to which they see themselves at one extreme as conservationist stewards of the multiple values of forests or at the other extreme as industrial catalysts towards maximum revenue generation. Where export or import tariffs supply their primary source of funding, forest authorities are strongly protectionist, but this is mostly no longer the case. One of the main deficiencies in forest policy making and the development of strategies for the forestry sector is the lack of involvement of forest authorities in the trade debate. Forest institutions tend to restrict themselves to the production of timber and (partly) its processing, while the developments in trade and markets play a surprisingly minor role.

The distinction between *national and transnational companies* is defined by the degree to which transnational companies can access and employ international capital where the cost of production is least – and frequent differences in scale sometimes afford transnationals increasing influence on policy (Mayers and Bass 1999). Transnationals may also be defined by their limited stake in the societal benefits of the host nation, not least because corporate executives and investors are more likely to reside outside the host nation. Transnationals certainly want to see improved market access but the evidence regarding their willingness to implement sustainable forestry is mixed. Much depends on the degree to which the companies adhere to codes of corporate social responsibility (see chapter x.x).

Competitive national forest industries occasionally share transnational's liberal perspectives on trade, but in many instances export barriers, import tariffs or subsidies are affording them some measure of protection from international competition. In addition to formal national industries, which account for 16 million employees world-wide, approximately 16 million work in the informal sector primarily based on secondary forest or domesticated trees (Van Rijsoort 2000) and 13 million work in the fuelwood trade (Poschen, 1997). Micro, small and medium scale industries make up the majority of forest industries in many countries (Lewis *et al.* 2003; May *et al.* 2003; Saigal and Bose, 2003; Sun and Xiaoqian, 2003; Thomas *et al.* 2003). The vast majority of artisanal production is traded locally rather than internationally and perspectives on international trade are likely to be protectionist due to fears about competition from imports and access to raw materials. Despite the fact that in some developing countries artisanal production dwarfs industrial timber production in employee numbers by up to 10:1 (Arnold and Ruiz Pérez 1998) these industries rarely have any say in formal surveys of private sector opinion on trade.

Private investors often support free trade on the basis of its economic arguments – but have very different perspectives particularly on the environmental consequences of free trade. Investors from the West have historically favoured fast-growing plantations in a few low-risk countries where environmental control and forest governance were strong (Argentina, Australia, Brazil, Chile, New Zealand, Uruguay or North America) – aware of the environmental arguments against free trade. Asian investors have been more ready to accept the risks of operating in natural tropical forests (e.g. in Indonesia, Korea and Malaysia) but possibly because of high returns generated by unacceptable social and environmental exploitation. (Moura-Costa *et al.* 2001). Conventional and often unsustainable logging can generate more attractive returns than sustainable forest management by a factor of 1.5 to 4 (Pearce *et al.* 1999; Salmi *et al.* 2001).

While *multilateral finance agencies and private investors* do not wield any direct power over forest-trade, they can (but do not always) have a major impact through the imposition of significant conditionalities on their lending. Multilateral agencies tend to favour trade liberalisation imposing conditionalities which facilitate foreign direct investment, reduce subsidies, tighten fiscal discipline, liberalise financial systems, promote competitive exchange rates, encourage privatisation and deregulation, stimulate tax reform and support clearer property rights. There have been examples in South East Asia and the Pacific, notably Indonesia and Papua New Guinea, where specific trade-impacting forest sector conditionalities have also been imposed (Filer with Sekhran 1998; Seymour and Dubash 2000; Barr 2001). There are, of course, significant differences in outlook within any one of these institutions - for example between lending and development arms of the World Bank – and individuals or departments within these institutions often acknowledge the social and environmental concerns over free trade.

Historically, *consumers of forest products and services* have shown little concern for the way in which forest products are produced – with a strong predilection above all for low cost. The rising living (and often environmental) standards in the developed world as a result of expanding trade have engendered widespread support for pro-free trade arguments. In developing countries the picture is much less clear leading to many counterpoints to the economic trade liberalisation arguments. In both areas, some consumers are increasingly demanding independent certification of the production process – for social and / or environmental standards (Bass *et al.* 2001). There has been growing concern over timber production in relation to climate change and biodiversity loss, particularly in Europe and North America. A small but increasing number of consumers have some notion of 'sustainable forestry' involving technical, social and environmental elements (as in FSC certification) and insist on voluntary eco-labelling. Markets for environmental services also provide new avenues for consumers to express social and environmental concern through trade although only where several environmental services 'bundled' together are we likely to see this translated into demand for a balance of objectives in forest management.

Many environmentally conscious consumers are also active in *environmental alliances*. The perspective on trade in such groups is generally anti-liberal, countering arguments that trade is good for the

environment (see 3.2.3). The timber trade is viewed through a lens of ecological sustainability (over and above financial or social sustainability). By way of contrast, *social development alliances* emphasise the need for improved social well being and poverty reduction over and above environmental concerns, often drawing on elements of dependency theory, and arguments about corruption, illegality and instability (see 3.2.2), to argue that the illusion of greater wealth through trade is just that (Retallack 2001). But there is often a remarkable divergence of opinion about how poverty eradication and greater equality can be achieved in practice. Some argue that liberal trade policies (but not forgetting good governance) are fundamental to economic growth, and that the continuing existence of high trade barriers particularly in developed countries is perpetuating poverty, i.e. the absence of free trade (Coyle 2001). But there are other, more sceptical views of the role of trade in poverty eradication. Many of the latter emphasise the importance of increasing 'freedom' or 'empowerment' or 'livelihood assets' as a means of tackling poverty, rather than focus strictly on financial gains (Narayan *et al.* 1999; Scoones 1998).

Researchers and practitioners in trade economics and forestry continue to adapt to two recent paradigm shifts: (i) away from simple financial models of economic development and well-being towards the development of multiple human capabilities (Alkire, 2002); (ii) away from the conception of a forest as a bounded primeval wilderness to one which acknowledges the place of forests in a larger natural-social system (Kanowski 2001). Both paradigm shifts have profound implications for the analysis of trade impacts on SFM – shifting the scales of measurement, the measure of good and bad impacts, into multiple new dimensions – based around a much more profound grasp of human well-being and forest sustainability. Since these recent developments are not yet widely owned the spectrum of opinion in debates on trade and forests spans the gamut of opinion.

Farming communities at the forest agriculture interface are largely marginalized in forest trade debates despite numbering approximately 1.2 billion people and despite their dependence on the forest margin or agroforestry systems which help them to sustain agricultural productivity and generate income (World Bank 2001). Farmers are not a homogenous group, and range from wealthy established land-owners to poor shifting cultivators. There is often a two-fold tendency towards increased migration into the forest followed by the development of more sedentary (and sometimes agro-forestry) systems (Byron and Arnold 1997; Peluso and Padoch 1996). It is wealthier farmers who are most able to become established and capitalise on new trade opportunities, whether these are for agricultural or forest-based products – they tend to espouse the economic virtues of free trade. Poor farmers may become more dependent on forests for subsistence over time, which can lead to conflicts over access to diminishing forest resources. In some areas, farmers have begun to plant timber species as crop alternatives or complements, sometimes as part of outgrower schemes sponsored by the timber industry (Mayers 2000; Mayers and Vermeulen 2002). Nevertheless, perspectives on trade and the call for trade protection are primarily related to agricultural crops.

One final category of forest dependent people deserve special mention because of the clarity of their views on trade liberalisation, the *forest-based indigenous communities*. Approximately 350 million people live within or adjacent to dense forests and depend on them to a high degree, Some 50 million of these are among the 250 million indigenous people in 70 countries worldwide (Rainforest Foundation 2001). Almost everywhere in the world, there is a record of encroachment on the lands of indigenous peoples (Bodley 1993). Studies demonstrate that such forced integration rarely allows tribal peoples anything more than a transition into the impoverished classes of the nation state and unsustainable use of the transferred natural resources (Cariño 1997). It is unsurprising therefore that the indigenous peoples perspective on trade liberalisation is unambiguous, stated in the combined "Indigenous Peoples' Seattle Declaration" (Indigenous Peoples' Caucus 1999).

6.4 Governance Dynamics and Linkages between Trade and SFM

6.4.1 Theories and Analytic Frameworks on Impacts of Trade Liberalization on Forest Governance

Prevailing theories about the forest governance impacts of trade liberalisation *per se* are outlined in the table below. The main features of governance that are thought to be influenced by trade liberalisation are listed down the left hand side of the table, whilst the second and third columns list the main viewpoints and theories on why trade liberalisation might improve the quality of forest governance or reduce it. The purpose of this rather dichotomised approach is to make it easier to interpret the evidence - and assess whether and where the 'truth' lies along the continuum between these viewpoints.

Table 6.1 Theories about how trade liberalisation could improve or reduce the quality of forest governance

<i>Feature of governance influenced by forest trade liberalisation</i>	Quality of forest governance improved by forest trade liberalisation	Quality of forest governance reduced by forest trade liberalisation
<i>Pressure for improved policy and regulatory frameworks</i>	Creates incentives for more efficient forest management and supporting frameworks because it removes restrictions like log export bans which make logs cheap relative to other factors of production promoting high wastage. Efficiency creates savings which allow for increases in compliance costs	Higher stumpage values make smaller trees, more distant forests and previously non-commercial tree species more viable and without existing regulatory capacity will lead to uncontrolled logging. Temptation for governments to reduce compliance costs to develop comparative advantage
<i>Capacity to internalise social and environmental externalities</i>	Higher forest product values expand the revenue base for strengthening regulatory capacity. Full-cost pricing and other government actions to limit externalities are not prevented under liberalised trade regime	Increases the power of the private sector over government leading to reduced concern for non-market forest values and equity, and erosion of natural and social capital
<i>Transparency and reduced corruption/rent-seeking</i>	Removes barriers to profitability and removes corruption opportunities of these barriers. Forces domestic production to compete with imports thus lowering rent-seeking opportunities. More open flow of information	Rewards to corruption higher in the export market than the domestic – rent-seeking (private sector) and rent-seizing (public sector) rise
<i>Economic growth fostering better regulations and institutions</i>	As wealth is generated from export-led growth, more accountable institutions and rewards to productive (less rent-seeking) investments rise, while petty corruption amongst public servants falls	Effective institutional capacity gets worse, before it gets better, with growth in developing countries – and many do not reach the threshold above which improvements kick in. Benefits flow only to national elites and international consumers

Main sources: Hellman *et al.* (2002); Leite & Weidmann (1999); Neumayer (2001); Ross (2001); Bardham (1997); Pearce (2002); Repetto & Gillis (1988); Karsenty (1998); Sizer *et al.* (1999); Bass *et al.* (2001); Utting (2002); Adams (1997); Wei (2000); Laarman (1999); WWF (2001); Anderson *et al.* (1995); Halle *et al.* (2002).

Whilst the above features of forest governance are thought to be the main ones that may be directly influenced by trade liberalisation, there is a range of other ways in which trade liberalisation interacts with other factors to drive changes in forest governance. Some of these are described in Tables 6.1 and 6.2

Table 6.2 Theories about key factors interacting with trade liberalisation

Factors interacting with trade liberalisation that influence forest governance	Nature of the interaction and influence on forest governance
<i>High resource values</i>	Forestry institutions in developing countries with valuable forests and a high dependence on natural resource exports are particularly vulnerable to export booms stimulated by trade liberalisation – the rents are easily captured by elites, and squandered (the ‘resource curse’)
<i>Democracy and stability</i>	Political regime is key to determining the impacts of trade liberalisation on forest governance. Stability is needed to install the ‘sticks’, whilst democracy is then necessary to grow the ‘carrots’, of effective governance
<i>Ecological footprint</i>	Liberalised trade enables richer countries with more effective environmental regulations to import natural resources from poorer countries with weaker regulations and externalise the environmental consequences of their lifestyles (thereby stamping their ‘ecological footprint’)
<i>Wider macro-economic package</i>	Trade liberalisation usually forms part of a package alongside investment liberalisation, devaluation, deregulation, privatisation, state downsizing, and the promotion of forest and agro-exports. Each of these other components of the package may have a powerful positive or negative effect on forest governance, and together they may create synergistic or conflicting effects, depending on context
<i>Land tenure</i>	The strength of property rights and institutions tend to go together – and the effect of trade liberalisation is to make weak rights and institutions weaker and strong rights and institutions stronger.
<i>National capability and preparedness to engage on forest trade issues</i>	Consequences of liberalised trade, whether they be good (e.g. greater wealth) or bad (e.g. poor or illegal forestry), may galvanise greater engagement of government, private sector and civil society agencies on forest trade governance issues. However liberalisation may also hand significant levels of governance control to TNCs and constrain national capability to regulate forest trade and industry.

Main sources: Isham et al., 2002; Ross, 2001; Treisman, 2000; Lofdahl, 2001; Tockman, 2001; Pearce, 2002.

6.4.2 Attempts to Establish Holistic Societal Processes of Forest Governance at the National Level

The processes to establish and implement policies, legislation, rules and regulations and agreements on forest governance have increasingly evolved from state centered reductionist approaches at the national level, towards more integrative and synthetic approaches. They are also increasingly involving national/sub-national and international/regional variables, as well as a combination of state centered and society-centered approaches to arrive at more holistic governance arrangements. These approaches seek to take into account the values and views of different societal groups, and to balance local/national and international demands on forests.

This new holistic and synthetic governance approach is best exemplified by the concept of the national forest programmes defined and endorsed by the IPF/IFF, and summarized by FAO (Box 6.1) as follows:

Box 6.1 basic principles of national forest programmes

1.Sustainability of Forest Development:

The essence and main purpose of the national forest programme are to ensure the conservation and sustainable development of forest resources.

2.National Sovereignty and Country Leadership:

National forest programmes are national initiatives for which the country must assume full leadership and responsibility.

3.Partnership:

National forest programmes strive to bring together all stakeholders in a process for which they will feel concerned and committed. The strength of this partnership will depend on its ability to draw upon the specific capacities of individual partners.

4.Participation:

In the national forest programme, issues, options and the resulting policies, strategies and programmes are agreed upon through participatory decision-making and consensus building among all interested partners.

5.Holistic and Inter-sectoral Approach;

National forest programme approaches forests as diverse ecosystems comprising many inter-dependent elements in dynamic equilibrium producing a variety of goods and services; forestry include trees in rural areas; forestry is practised within the context of sustainable land management, environmental stability, social and economic development. Forest dwellers are also part of this ecosystem.

6.Long-Term Iterative Process:

The national forest programme is a cyclic process comprising planning as well as implementation, monitoring and evaluation activities. It is also an iterative process which continuously reflects changes in the environment and the acquisition of new knowledge even during implementation.

7.Capacity Building:

One of the essential elements of the national forest programme. Throughout the process, actions are taken to develop the planning and implementation capacity of the national institutions and other key actors with a view to decrease dependence on external assistance when necessary.

Box 6.1 Basic principles of national forest programmes - continued

8. Policy and Institutional Reforms:

One of the priorities of the national forest programme is to ensure that the policy and institutional framework is conducive to sustainable forestry development. These must address policy and institutional issues in a comprehensive manner which recognizes the interdependencies and interlinkages between sectors.

9. Consistency with the National Policy Framework and Global Initiatives:

The national forest programme must link with National Development Plans with regional and local strategies. They should be integrated in the land-use planning at national and local levels; and furthermore into broader-scope programmes such as Environmental Action Plans and the actions to implement UNCED's Agenda 21 and related conventions and initiatives.

10. Raising Awareness:

The national forest programme must raise the visibility of the forestry sector and its priority in national agendas. The full value of forests and trees must be recognized as well as their contribution to social, economical and environmental issues.

11. National Policy Commitment:

The national forest programme must be backed by the long-term commitment of all national actors, particularly at political and decision-making levels.

12. International Commitment:

The long-term commitment of the international community and its institutions is essential. These should respect the policies, strategies and programmes approved by the countries and adapt their own priorities to the country priorities. [Source: http://www.fao.org/forestry/](http://www.fao.org/forestry/)

This type of comprehensive approaches to forest governance seem to work best where there already is a sufficient level of consensus on the “vision” of the forest in local and national development, and a tradition of long-term development planning (e.g. in the European countries and some politically stable developing countries). They also offer to the developing countries a tool to integrate the external actors (i.e. donors and international financing institutions) into a development framework that has been negotiated in a country-led process. This may be the main attraction to many developing countries. They seem to be more problematic in countries where there are major underlying forest governance related conflicts (e.g. regarding forest land tenure or the rights of indigenous forest dependent people) influencing the forest sector, where high resource values are combined with a weak overall governance capacity, and where there are major impediments to the participation of important societal groups in the dialogue and debate. A high level political commitments also seems a prerequisite for the success of this type of holistic and synthetic approaches (e.g. Savenjie 2000).

Decentralization of government responsibilities is an important factor influencing forest governance and the societal processes to negotiate related institutional arrangements. A recent World Bank study in 1999 found that more than 80% of all developing countries and countries in transition are currently undergoing some form of decentralization (Manor, 1999). These processes have led to a reconsideration of the role of the central government in administering the forest resources, and put more emphasis on the roles of the local governments and especially the local communities regarding both rights and responsibilities. This shift of balance needs to be recognized also in national forest programme processes, e.g. through increasing decentralization of the planning process and improved engagement with and empowerment of the groups who will bear the major responsibility as custodians of the forest resources. Countries with a federal structure also have their specific dynamics regarding forest governance processes. This group includes countries with large forest areas, such as Brazil, Canada, Germany, India and Russia. Much of the authority vested in the central government in the non-federal countries may in these countries be delegated to the federal state level by the constitution. The structures for forest governance tend to be complex, multifaceted and to have strong cross-sectoral linkages e.g. with agriculture, water, transportation etc. (Schmithussen et al 2003 and Broadhead 2003). This broadens the number of groups involved in the dialogue and adds to the complexity of the negotiation process.

Another major trend impacting on the societal processes for forest governance is the privatization and/or commercialization of forest and/or forest management. This trend is shifting the balance of power from the public sector towards the private sector, and requires a greater involvement of private sector actors (e.g. through industry associations) in processes that determine the normative framework and incentives for their participation. It also necessitates specific processes to negotiate public-private partnership type arrangements between different societal groups (e.g. the central or local government, private sector and local communities) focusing on concrete partnership arrangements.

In the national forest programme type comprehensive societal processes dealing with forest governance, trade as such seldom plays a major explicit role. However, such trade related issues as (i) creating a competitive environment for domestic and foreign direct investment in the forest sector, (ii) making use of the opportunities in tradeable environmental services, (iii) supporting and facilitating research and development to increase the competitiveness of the forest sector and especially the forest industries and (iv) ensuring market access to exports e.g. by promoting certification are often among the key debates between the different societal groups. The level of consensus on the “vision” of the forest sector, as well as the potential importance of the sector in foreign trade, to a large extent define the importance given to these issues as well as the nature and divisiveness of the debates.

6.4.3 Empirical Evidence on Trade-Related Governance Impacts at the National Level

Impacts on Demand for Improved Policy and Regulatory Frameworks

Evidence that trade liberalisation encourages sustainable forest management and hence improves policy and regulation, seems to be scant. Where regulation is already effective, removing a NTB should encourage more efficient processing and SFM. But when there is pre-existing weak governance or control, higher external demand pressures and producer prices are more likely to encourage unsustainable logging and trade than more efficient processing (Sizer *et al.* 1999). Econometric analysis shows that higher log prices are associated with higher rates of logging in tropical areas (Kaimowitz & Angelsen 1998), whilst Barr (2002) points out that there is little evidence for improved milling efficiency following removal of a key trade restriction.

A further problem is the link between economic efficiency and SFM. The international timber market, except small green ‘niche’ markets, does not distinguish between efficient SFM and low cost forest exploitation. Many operators are only ‘efficient’ and their operations economically viable because their costs are low. The main reason for this is the lack of environmental regulations and social standards, and/or the ability of the timber industry to evade them. For example, Sizer *et al.* (1999) noted that pulp was three times cheaper in Indonesia than Sweden, both countries using state of the art mills. In the case of Sweden, production was based on secondary forest management and certified plantations, while in Indonesia, natural forests were logged.

Although it was stated earlier that the impacts of tariff reduction are normally minimal, the elimination by China of its log import tariffs in 1998 has placed serious governance pressures on Indonesia, the Russian Far East and Siberia - countries with weak governance before 1998. There are similar concerns about the forest governance impacts on low cost plywood exporting countries like Indonesia as a result of planned cuts in plywood tariffs by the EU, Japan and China (Rice *et al.* 2000).

But neither is the evidence strong that trade restrictions reduce demand pressures on forest governance. A clear example of where trade restrictions have done little to dampen external demand pressures is Indonesia where the log export ban helped build up the largest plywood export industry in the world, much of the raw material coming from illegal logging (Ross 2001). The 2001 log export ban in Indonesia has had little effect on actual log export flows and the introduction of such trade restriction only increased the level of irregularities laying high pressure on governance practices to counteract negative developments in the sector.

On balance, the evidence suggests that for most developing and transition economy countries, *existing* regulatory and governance capacity is too weak to control external demands on the resource, and a likely outcome of trade liberalisation is an increase in unregulated logging in the absence of effective governance. Evidence also confirms that trade liberalisation has a chilling effect on environmental and

social regulations, at least in developing countries. Utting (2002) reports that ‘competitive fears’ are often cited as the reason why developing countries have not introduced stricter environmental and social regulations. But even where appropriate policies and regulations are in place, compliance with the law remains one of the major issues of international and domestic concern.

Impacts on capacity to internalize social and environmental externalities

Uncompensated social and environmental externalities, arising from trade and in particular trade liberalisation, that undermine the prospects for sustainable growth are well recorded. A study of the economic impacts of trade liberalisation on the Tanzania forest sector found that the economic costs, including an accelerated deforestation rate (partly due to weak control), almost exactly outweighed the benefits, which included higher forest product values and a growth in forest product trade and employment even though liberalising the natural resource based economies of Tanzania was crucial for raising living standards. (CEDR/UNEP 2001).

When trade liberalisation is accompanied by a Structural Adjustment Programme, deregulatory reforms and/or privatisation, there can be serious problems in regulating an emboldened private sector. Key observers argue that there are strong social and environmental externality reasons for protecting the community forestry sector against external trade pressures in favour of the provision of social and environmental benefits of forests for the local communities.

Those who argue that trade liberalisation can improve the financial basis for strengthening institutional capacity have to face considerable evidence that, unless governance is *already* sound, forest revenue tends to be squandered. It has been estimated that only about 10% of the revenue from developing country logging and sawnwood production, and about 35% from other timber products, remains in-country (EIA 1996). Public budgeting procedures in most countries do not allow for a direct re-investment of the necessary financial resources into the forestry sector. This has led to the well-documented strategy in Costa Rica to achieve payments for environmental and social services of forests through the direct means of fuel taxation and the creation of a special institution (FONAFIFO).

However, that is not to say that the record of protective trading governance regimes in managing non-market values is strong in the overall analysis. Laarman (1999) points out that state control and ownership of forest resources in Latin America in the 1990s reinforced social inequities, and that state regulation of private forests can result in fraud and injustice. Considerable political strength and courage, plus research and administrative capacity, are needed to establish the necessary economic incentives for SFM and to internalise costs (Richards 2000). It is also a question of reducing externality-inducing subsidies.

Major international institutions and organisations, including the World Bank and FAO as well as bilateral cooperation agencies and NGOs are supporting governments world-wide in their efforts to internalise social and environmental externalities. However, the attempts remain at a project support level and have not yet led to major policy and legislative changes, with the exception of Costa Rica. This limits the potentials of emerging markets for environmental services, including the ones for carbon sequestration forestry.

Impacts on corruption and rent seeking

Corruption occurs both in the public sector, where it may involve senior politicians, departmental heads, customs officers, and other senior public sector officials, and in the private or corporate sector where bribery and other unofficial payments may be aimed at securing influence over those in the public sector (‘state capture’) or securing contracts from government (‘public procurement kickbacks’) (Hellman *et al.* 2002). It is probably the most studied indicator of the quality of public and private sector governance – although there are rather few analyses in the forest sector to date.

Empirical studies find public sector corruption is higher in economies characterised by greater state intervention and trade restrictions (Treisman 2000). Economic protection and corruption are correlated in many environmental studies (Ades & Di Tella 1999; Damiana *et al.* 2000). One case study shows that complex import and export procedures involving a high level of discretionary powers led to rampant high-

level corruption before trade liberalisation swept many of these procedures away. In some Amazon countries, the attempt to use trade restrictions to encourage mahogany conservation, mainly in response to international pressures, shows how trade policies tend to be ineffective in achieving environmental objectives, and often lead to opposite effects - in this case to the diversion of mahogany exports to unregulated markets.

Forest trade liberalisation may not reduce the overall level of corruption – Treisman (2000), for example, concluded that an increase in trade openness has a “depressingly small” impact on corruption – but it may change the pattern of winners and losers from it. This is the argument of some observers, such as Khan (1996), who see liberalisation altering the distribution of corruption benefits or ‘surplus’ rent to different stakeholders, since it changes the balance of power among the main beneficiaries.

Where the state does not effectively regulate or tax the forest sector, rent-seeking opportunities shift to the private sector, especially international or transnational companies. For example, a study of economic and institutional reforms in Tanzania, Zambia and Zimbabwe by Reed (2002) shows that there has been a transfer of the control of natural resource wealth from the state to the private sector. While reducing some corruption by state elites, this has resulted in collusion between national elites, senior public officials and corporate interests including transnationals.

In summary, the evidence mainly supports the contention that removing or reducing trade restrictions is likely to reduce public sector corruption and other illegal activities. But there are important caveats: liberalisation alone will not secure this outcome, it needs strong regulatory and institutional back-up; it may be much more difficult where windfall resource rents are involved; and sometimes it may not represent a real reduction - merely a change in the pattern of winners and losers. In all of these cases, ways to improve governance involving civil society as a whole as well as government institutions need to be designed on a country-specific basis approaching any irregularities in a broader context than the one of forestry.

Impacts of economic growth on forest governance

To what extent trade liberalisation generates *sustainable* economic growth is a discussion beyond the scope of this paper. It can be noted here that there is a strong positive correlation between per capita incomes and the quality of governance (Kaufmann & Kraay 2002), just as higher levels of corruption associated with trade restrictions are correlated with lower economic growth and per capita incomes (Hellman *et al.* 2002). Corruption hinders growth because it reduces foreign direct investment (FDI), and because the FDI it does attract is of lower quality and less growth-inducing.

However, in examining data from transition economies¹²⁸, Kaufmann and Kraay (2002) find that while there is a strong positive causal effect running from better governance to higher per capita incomes, there is a weak and even negative causal effect in the opposite direction, i.e., rising incomes can be associated with a decline in governance quality. These authors then used more qualitative diagnostic data from Colombia, Honduras and Peru, to argue that as countries become wealthier, higher incomes are appropriated by captor firms and elites, and the very success of these captor firms undermines public policies, regulations, law and order. In a growth situation there is an increasing demand for ‘state capture’ which is often abetted by an *a la carte* supply of laws, regulations and policies offered by corrupt politicians. But the authors admit that these explanations are speculative, and the relationships need further research.

Certainly, proceeds from illegal logging have been used to finance civil disturbance and wars in a number of countries, for example, in Liberia (Global Witness 2001), Cambodia (Le Billon 1999), Nicaragua and Indonesia (Halle *et al.* 2002). But there is little credence in blaming trade liberalisation *per se* for this. Such conflicts are rooted in profound social and political problems. Indeed some of these problems have been built up through the power of protected elites in closed economies (Reed 2002). Some observers note that the risks of destabilisation and conflict are probably less than the political and security benefits of more open trade, including those stemming from increased international integration and cooperation (Halle *et al.* 2002).

¹²⁸ Econometric analysis, based on a 1999 survey of ‘state capture’ corruption among 4,000 companies working in 24 transition countries.

Governance Issues deriving from the International Trade Regime

The negotiations on the compatibility with WTO trade rules of the forest related trade measures included in the multilateral environmental agreements takes place in the WTO Committee on Trade and Environment. In the Fourth Ministerial Conference in Doha, Qatar, in November 2001, Ministers agreed to launch negotiations on certain aspects of the trade and environment linkage. These negotiations aim at clarifying the relationship between the multilateral trade and environment regimes, and cover also information exchange between WTO committees and MEA secretariats, as well as the liberalisation of trade in environmental goods and services. The negotiations will focus especially on

- (i) environmental measures on market access especially in relation to developing countries,
- (ii) Trade-Related Aspects of Intellectual Property Rights, and
- (iii) labelling requirements for environmental purposes.

The negotiations are informed by an information session with different secretariats of the multilateral environmental agreements. The strength of the arguments and positions of the negotiating parties will define whether the outcomes will strengthen or weaken forest governance.¹²⁹

In the international trade debate linked to WTO, country positions and alliances between countries concerning these issues continuously evolve. A striking example of this fluctuating landscape is seen in the emergence of the G20+ at the WTO Ministerial Conference at Cancun and the marked shift by Brazil from the so-called “Cairns Group¹³⁰” into that new alliance (Choike 2003). Three important considerations are likely to influence countries’ views on liberalising trade and its impacts on SFM: (i) the comparative benefits of forests and forest trade compared with other, particularly agricultural land use and trade alternatives; (ii) the degree to which the development of trade in forest products and services needs to be nurtured or is considered able to compete internationally; and (iii) the extent to which other non-commodity societal benefits of forests outweigh and are threatened by the forest products trade. Some commentators have noted the under-representation of forest advocates and expertise in recent negotiations on trade and the environment at the WTO which perhaps reflects government assessments of forests significance (Araya 2001).

Many commentators also note that the decisions regarding agricultural products may have far more profound impacts related to forest governance, thorough wider land-use impacts, than those directly related to forest products. There are still contrasting views as to whether agriculture should be fully integrated into the rules and disciplines of WTO. There are at least three country groups with divergent views on this issue; (i) the Cairns Group pressing for full and speedy integration, (ii) the group of developing countries pressing for the concept of special and differentiated treatment (SDT), and (iii) the group of mainly industrialised countries and transition economies, putting emphasis on non-trade concerns (Horgan 2003). The role of SFM experts and advocates in these discussions is even more limited than in the trade dialogue directly related to forest products’ trade. Due to the complexity and site specificity of the agriculture-forestry linkages, it is difficult to foresee what the impact on SFM of the WTO decisions on agriculture will be.

Global forest policy debate, trade and governance

The International Tropical Timber Council (ITTC) , as an intergovernmental forum for dialogue for the producers and consumers of tropical timber, has been effective in its purpose of facilitating discussion and international cooperation on the international trade and utilization of tropical timber and the sustainable management of tropical forests. Overall, perhaps the major contribution of ITTO was its role as the first (and until the 1990s the only) forum for debate between wood producer and consumer countries. The forum has always depended upon consensus which all 58 country parties tend to be committed to it.

¹²⁹ (http://www.wto.org/english/tratop_e/envir_e/envir_negotiations_e.htm)

¹³⁰ Formed in 1986 the Cairns Group is a coalition of 18 agricultural exporting countries, which together account for one third of the world’s agricultural exports. The members of the group are Argentina, Australia, Bolivia, Brazil, Canada, Chile, Costa Rica, Fiji, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, the Philippines, South Africa, Thailand and Uruguay (Cairns Group 2000).

However, both debate and progress of the member states has been too slow for many NGOs, which 'defected' in the mid 1990s to more 'fast-track' initiatives such as the Forest Stewardship Council (FSC) in which they could be drivers rather than observers, as in ITTO. The focus of ITTO tended to shift in the late 1990s from its normative functions towards project funding, and in doing it lost some of its policy edge.

Whilst, for some, ITTO has not shown the leadership on critical governance issues that might have been expected (largely being constrained in tackling contentious issues by its membership) – there are signs that it is starting to play an increasingly influential role. The recent meetings of the International Tropical Timber Council (ITTC) have perhaps been most remarkable for their lack of controversy as well as for the fact that delegates have debated and made progress on what had previously been highly contentious issues, including certification, illegal logging and the role of civil society within the ITTC. These are the very issues that have long paralyzed the Council and drove many NGOs to dismiss it as an irrelevant, if not destructive, force in tropical forestry.¹³¹

NGOs have re-engaged with the ITTA process since 2002 with the establishment of the Civil Society Advisory Group by the International Tropical Timber Council and re-negotiation of the ITTA. Key issues being dealt with in ITTA re-negotiation through the workings of this group include: expansion of the agreement to non-timber forest products; promoting the interests of local and indigenous communities, including core labour standards; and, trade related aspects of GMOs and invasive species. Most of these are issues with a significant global impact on forest governance.

UNFF derives its mandate from the ECOSOC and constitutes the principal intergovernmental fora where forest issues are debated. Through the establishment of the Collaborative Partnership on Forests (CPF) UNFF has a direct influence on the work of the major international organizations active in the forest sector. It also has set up a multi-stakeholder dialogue of major groups identified in Agenda 21 to enrich its deliberations, and promotes inter-sessional work by ad hoc expert groups and country-led initiatives. UNFF represents what could be labeled as a "modern" intergovernmental negotiation process, incorporating strong elements of civil society participation in its dialogue and debate.

While the UNFF was intended to address trade issues, the view of NGOs (e.g. Tarasofsky 2001) is that virtually no substantive agreement or progress on these issues has occurred and that little further contribution to trade policy can be expected from UNFF. This view is reinforced by a review of the reports from the UNFF sessions 1-3 to ECOSOC. Although, according to the UNFF multi-year programme of work, trade is one of the common items on the UNFF agenda no discussion or actions by the Forum in this area are reported (<http://www.un.org/esa/forests/documents-unff.html>). Neither have trade issues – with the exception of certification and labeling of products from sustainable managed forests - been the focus of any of the government and organization led initiatives that have been organized during the IPF/IFF/UNFF process. This would seem to indicate that relatively little weight has been given to trade issues by the actors involved in the intergovernmental dialogue on forests.

Regional processes – intermediaries or independent governance tools?

There are more than 100 regional agreements affecting a range of processes from political and economic issues, to security and trade. Regional trade agreements (RTAs) are the most prominent of these - some have major forest trade impact such as those within the Asia-Pacific Economic Cooperation (APEC), North American Free Trade Alliance (NAFTA), and European Union (EU). The countries belonging to these "trade blocks" are also the major players regarding the WTO discussions on forest products' trade, and the negotiations within the blocks are an important basis for common positions.

There are divergent views as to whether these agreements complement or challenge the global multilateral trading system. WTO has in place a Committee on Regional Trade Agreements (CRTA) to examine individual RTAs in this respect. The Dispute Settlement Body (DSB) of WTO also seems to serve as a higher level appeals court for disputes arising within the boundaries of individual RTAs - the example of this is the softwood lumber dispute between Canada and the US which was referred to WTO to find an acceptable resolution within the framework of NAFTA (Horgan 2002).

¹³¹ http://www.etfrn.org/etfrn/newsletter/news39/nl39_oip_4_7.htm

In Africa the important regional trade agreements include the Arab Maghreb Union (AMU), the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS) and the South African Development Community (SADC). Due to the strong overlaps of agriculture and forestry in many regions of Africa, the WTO negotiations related to agricultural products have a special relevance to forestry in Africa, especially in terms of potential land-use impacts.

The countries belonging to the Latin American Economic System (LAES) belong to three regional groupings with RTAs, the Common Market of the South (MERCOSUR), the Andean Community (CAN) and the CARICOM. They account for one quarter of the global forest cover, include countries with a well developed export oriented forest industry, and can consequently be expected to have a considerable interest in trade impacts on forest governance. The Central American countries seek to promote economic integration through the Central American Common Market (CACM). Trade in forest product does not, however, play a significant role in CACM (Horgan 2002).

The cooperation within the Association of the South East Asian Nations (ASEAN) covers several areas, which include among others trade, agriculture and forestry. Forestry is included as a cross-cutting issue in the ASEAN Action Plan to implement the ASEAN vision 2020. In the area of forest products' trade the ASEAN member countries have coordinated common positions regarding early voluntary sector liberalization (EVSL) program for forest products in preparation for the APEC meeting.

The post-UNCED era has also seen the emergence of a number of regional and sub-regional forest related environmental agreements (e.g. the establishment of the Central American Council for Environment and Development - CCAD - in a meeting of the presidents of the region in 1989) and processes (e.g. the Yaounde Declaration in 1999). These agreements and processes have mainly centered on forest and biodiversity conservation, with trade related issues heavily biased towards the problems of illegal logging and related trade. In the new millennium also specific regional initiatives and processes have emerged to address this issue (see chapter 6.4.7) but the effectiveness of these still remains to be validated.

6.4.5 Role of information and transparency

Access to information and effective systems for information management are a precondition for effective governance and empowerment. Without access to reliable and transparent information and knowledge on specific issues, informed participation of a wide range of actors in forest governance related processes at different levels is not possible. Information is important especially for:

- enabling the civil society to press for changes in forest governance to effectively deal with such issues as corruption and illegal logging,
- promoting understanding and broader support in the society for the role of the forest sector, and enabling a commonly shared “vision” on its role to be negotiated,
- raising public awareness on the multiple functions of forests and the forest sector and generating political commitment for change,
- helping to address cross-sectoral issues by articulating the linkages between the forest sector and other sectors,
- helping to agree on viable sectoral policies, strategies and actions on specific issues.

Currently tens of research institutions, NGOs and governmental agencies maintain forest related web-based information services, however, very few of these provide information related to trade impacts on SFM (with the exception of information related to illegal logging and trade and environmental services). There is certainly a gap in this area, and designing specific actions e.g. within FAO NFP Facility and/or the WWF - WB Alliance to disseminate information on specific trade and SFM related issues would provide a better basis for dialogue and debate on these issues in national forest governance processes. Specific measures would need to be taken also to bridge the “digital gap” i.e. reach those societal groups, especially in the developing countries, with no access to the internet. This would be a legitimate area where development cooperation funding could be targeted.

6.4.6 Linking International and National Levels in the Trade-SFM Nexus

Establishing the link between the international forest dialogue and national and local forest related processes is one of the main challenges in implementing the synthetic approaches to forest governance. Expanding this linkage to the governance of trade at different levels is an even more daunting task. Although in many countries the participants in the international forest dialogue are also somehow involved in, or at least aware of, the national processes, only in some cases have inter-ministerial working groups or similar structured bodies been established to facilitate the flow of information between the international and national processes. Even less frequent are attempts to ensure coherence of the positions and actions in the forest and trade dialogues.

During the IPF/IFF process two major initiatives were launched to improve this linkage, the “Six Country Initiative on Putting the IPF Proposals for Action into Practice”, involving Finland, Germany, Honduras, Indonesia, Uganda, and the UK, and the “Three Country Initiative on Implementing International Forest-Related Agreements through National Forest Programs in Latin America” which was a joint initiative of Ecuador, Germany and the Netherlands. The aim of the “Six Country Initiative” was to enhance the implementation of the IPF proposals of action at the national level, and to develop guidance from country experiences for consideration by the IFF. The “Three Country Initiative” sought to increase the understanding on the international forest-related initiatives and their relevance to national forest programmes, and to formulate joint action to support nfp processes based on this.

These two exercises demonstrated the value of the international forest related dialogue to national and local processes by establishing that many of the outcomes of the international agreements and processes had been internalized in the national forest programmes. These include the predominance given to the conservation and sustainable management objective, the inter-sectoral approach, the major concern given to stakeholder participation and attention given to their forest related values (Synthesis Report 1998). It is less evident, however, how the experiences from the implementation of forest related processes at the national and local levels is channeled back to the international forest related processes. The linkage to international dialogue on trade is even less clear. The IPF/IFF Proposals for Action include several trade related ones (e.g. related to market access for forest goods and services) but how these are addressed in the national processes, and whether or not this national level dialogue is linked to the trade dialogue, has not been systematically assessed.

In addition to these two initiatives linked to the IPF/IFF process, also other types of mechanisms have been set up to bridge the gap between international and national forest governance processes. An example of these is the World Bank-WWF Alliance which has been created to effect changes in forest policy and practices, to help safeguard biodiversity, and alleviate poverty. The Alliance is working with governments, the private sector, and civil society to create 50 million hectares of new protected areas of forest. It is also helping ensure that a similar amount of existing protected areas come under effective management by 2005. In the same timeframe, the Alliance aims to have 200 million hectares of the world's production forests under independently certified management.¹³²

FAO has established the National Forest Programme Facility as a funding mechanism and information unit created in response to the IPF/IFF/UNFF meetings which recognized the essential role of national forest programmes in addressing forest sector issues. The ultimate goal of the Facility is to assist countries to put into place forest policy planning and implementation processes that effectively address local needs and national priorities, and reflect internationally agreed principles for national forest programmes. The Facility seeks to:

- improve the ways in which government and civil society actors are able to cooperate in planning and enacting policy;
- stimulate the formation of national forest programmes in countries without a process and strengthen or revive stalled processes;
- ensure that national planning processes meet globally accepted levels of inclusiveness, coherence and sustainability;
- strengthen and streamline knowledge and information relevant to national forest programme implementation and make this knowledge available where and when it is needed.

¹³² (<http://lnweb18.worldbank.org/essd/>)

The Facility operates through an information platform in the FAO headquarters combined with a national grants' system to facilitate stakeholder participation in national forest programme processes¹³³.

So far there have been no structured efforts (e.g. along the lines of the "Six Country Initiative") to bring together the trade and forest dialogues and processes at the international and national levels. The WTO Committee on Trade and Environment (CTE) might offer a possible venue to improve this coordination at the international level. How to achieve this at the national level, e.g. in preparation for trade and forest related international negotiations requires country specific measures, such as the setting up of inter-ministerial working groups and consultations with a broader group of actors in preparation of critical events.

In summary, since the early 1990's the linkages between the international, regional and national/local forest governance processes have evolved through a variety of processes and arrangements increasing the coherence and improving the coordination at different levels. These are supported by a vast network of actors at different levels with rapidly evolving means for sharing information and exchanging views on critical issues. Transparency of information on issues related to SFM from global to local levels has dramatically improved, especially among those stakeholders with access to internet and its information services. The linkages between these and processes governing trade, however, are at a more incipient stage as are networks providing targeted information on trade – SFM related issues. Trade issues still tend to remain in the domain of a relatively limited group of specialists, whether on the government or civil society side. Due to the difficulties in isolating trade impacts on SFM from other impacts, dialogue and debate on these issues remains on a rather theoretical level, with the possible exception of such clear-cut issues as illegal logging and trade in illegal timber.

6.4.7 Initiatives in multi-layer governance: models, instruments and experiences

A number of multi-layer forest governance approaches have emerged in the past decade bringing together different actors (governmental and non-governmental) and levels (local-national-regional-international) with an attempt to either restrict or eliminate negative impacts of trade on SFM, or to harness the potential of trade in supporting SFM. Some early experiences on the implementation of these approaches are discussed below.

FLEG(T): an evolving multi-layer governance model for trade and SFM

The FLEG(T) initiatives are examples of innovative ways to introduce multi-layer forest governance models focussing specifically on trade impacts on SFM. The World Bank sponsored Forest Law Enforcement and Governance (FLEG) resulted in the East Asian FLEG ministerial conference in Bali, and the AFLEG Ministerial Conference in Africa. These laid down the basis for joint multi-stakeholder action both in the exporting and importing countries to curb trade in illegally harvested timber in Ministerial Declarations at the highest political levels. Both Ministerial Declarations recognized – at least indirectly - the shared responsibility of exporting and importing countries in combating illegal logging and associated illegal trade, thus establishing the basis for a model of governance involving actors from the local to the international levels. This model is conceptually linked to the type II partnerships launched at the WSSD in Johannesburg in August 2002.

The European Union FLEGT initiative, based on a Resolution of the Council of the European Union (2003/C 268/01), thus also expressing a political commitment at the highest levels, has produced the EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) outlining a voluntary process aiming to curb the imports of illegally harvested timber to the EU member countries. Some of the – from the governance point of view – interesting innovative features of the FLEGT include:

At the international-level, involving governments and intergovernmental organisations:

- initiating a long-term dialogue with wood producing and consuming countries to extend international collaboration to tackle illegal logging and develop a multi-lateral framework on which actions could be based

At the national level in the EU, involving governments (central and local) and the private sector:

¹³³ <http://www.fao.org/forestry/>

- exhorting EU member states to adopt policies to exclude illegally sourced timber from public procurement
- guiding public sector procurement to deal with legality when specifying procurement procedures
- promoting voluntary corporate codes of conduct and encouraging banks and financial institutions to consider environmental and social factors when assessing investments in the forest sector

At the national and local level in the partner countries, involving governments (central and local), development partners, private sector, NGOs and local and indigenous communities:

- setting up of a voluntary scheme of licenses and a standardized procedure for verification in the exporting countries to check the legal origin of the products and issue export certificates (national dimension in exporting countries)
- setting up a regional system which would verify that timber originating from non-signatory third countries is also of legal origin (regional dimension)
- setting up of an independent monitoring and verification system and promoting transparency of information
- support to policy reform processes and capacity building
- strengthening land tenure and access rights especially for marginalised rural communities and indigenous people
- strengthening effective participation of all stakeholders, notably non-state actors and indigenous peoples, in policy making and implementation
- engaging the private sector of the timber producing countries in the efforts to combat illegal logging
- using development cooperation to promote just and equitable solutions to the illegal logging problem which do not have adverse impacts on poor people

Indonesia and the UK have developed their own bilateral MoU on cooperation to improve forest law enforcement and to combat illegal logging and the international trade in illegally logged timber, signed in April 2002. In addition to law enforcement and control, the MoU puts emphasis on the participation of the civil society and on capacity building. It has e.g. resulted in the UK Timber Trade Federation producing its own code of conduct regarding illegal timber defining sanctions to those companies that do not adhere to the code (RIIA and FERN 2002). Some other EU countries are considering or in the process of negotiating similar agreements, and Indonesia and Japan have agreed on a “joint announcement” with similar elements.

To be successful the FLEGT-type governance model needs to bring together actors from different branches of the government (forestry, local government, police, military, customs), private sector and financing institutions to NGOs and local community groups (i.e. most if not all the of the important societal groupings mentioned earlier). These groups will need to have the institutional incentives and capacity to act out their roles in what in many cases will be a difficult process of transformation. In many countries this will require fundamental changes in the overall governance environment in which the forest sector operates.

The net social impacts of the FLEGT- model are difficult to estimate, and will vary from case to case, as there will be both losers and winners in this equation. Special measures will, however, be needed to mitigate the (at least in the short term) negative social impacts of the reduction/elimination of illegal logging, as these are likely to hit hard some of the poorest groups in the society. The on-going processes of decentralization need also to be taken into account by strengthening the capacity of local governments to assume increasing responsibilities in the control of illegal activities in the forests. E.g. in Peru it is estimated that in some key timber producing regions 40% of the population get their livelihoods from forest related activities, some 80% of this based on illegal logging. There is an elaborate system of organizing and financing illegal logging operations involving thousands of illegal small-scale operators, putting political pressure on local government officials who have been recently given increasing responsibilities in forest governance as part of the decentralization process. To replace this system with a system based on legal operations requires massive efforts in control and capacity building (Chirinos and Ruiz 2003, and ITTO, 2003). In Indonesia it is argued that the breakdown of a strong central government resulted in a more insidious type of decentralized collusive form of corruption which is harder to root out (Smith, Obidzinski, Subarudi and Suramenggala, 2003).

Both the EU FLEGT process and the bilateral initiatives, are still in early stages of implementation, and it is not possible at this stage to give any assessment on their impact. However, they offer an interesting example of multi-layer and multi-stakeholder forest governance, with an attempt to by-pass some of the

potentially negative impacts of WTO rules on SFM through voluntary agreements. It is, however, clear that the full elimination of trade of illegally harvested timber will require levels of resources which may not be forthcoming, and that some measure of “leakage” will be inevitable. The main factors affecting the success of the FLEGT model include (i) political will and stakeholder interest, (ii) an adequate policy and especially legal framework (to determine what constitutes “illegal” is often problematic as different laws may be in contradiction with each other), (iii) institutional arrangements for implementation (both in the exporting and importing countries), and (iv) sufficient capacity to implement these arrangements. An effective strategy and action plan defining the roles and responsibilities and building both incentives and effective control and sanctions is needed in each participating country to make this happen. It is also evident that this model is possible only in countries where trade to “environmentally conscious” countries plays a major role in forest use.

Forest Certification as a Governance Tool

Forest certification is a governance model bringing together the economic (e.g. industries and forest owners), ecological (e.g. environmental NGOs), and social (e.g. forest workers, forest dependent indigenous people) around a market based governance instrument with the aim of promoting SFM. It is a multi-stakeholder and multi-level instrument mainly governed by the civil society and private sector, although in many cases with some indirect or direct involvement of the government. It is also clearly linked to the intergovernmental forest dialogue, e.g. through the several proposals of Action of the IPF/IFF supporting the application of certification schemes, and characterizing such schemes.

The key governance related issue regarding certification is whether the different systems are geared towards maintaining the *status quo* or improving forest management towards sustainable forest management from what is the current situation in a given country. This in turn is related to the fact that there is no scientific definition as such for SFM, and hence the definition is always a value judgement that is determined by what societal groups participate and/or dominate the debate and whose interest they seek to promote.

FERN (2004) has carried out an assessment of the major governance related characteristic of the different schemes: (i) is the system based on a set of clear minimum performance based threshold? (i.e. are there clear performance standards instead of only systems standards), (ii) does the scheme require balanced participation in the standard setting process? and (iii) is the standard setting dominated by the forestry sector?, (iv) is consultation of stakeholders in certification process required?, and (v) is the scheme sufficiently transparent (i.e. are summary reports freely available on websites). The result of the assessment was seen by FERN as a reflection of the “too close” links that most systems have with the forestry sector. The dominance of the forest owners and industries in the governance of the systems was interpreted as an important factor orienting these systems towards maintaining the status quo and in putting their independence in doubt.

Despite of these shortcomings, according to reviews and evaluations (e.g. Bass et al. 2001; Eba’a Atyi and Simula 2002) Certification has had certain positive impacts on forest governance. Especially related to community and private forestry, it has:

- enhanced transparency of information through better monitoring, evaluation and reporting of forest activities
- increased dialogue with government and other stakeholders
- increased acceptance of community representatives in local and national policy fora, and in general increased transparency of company operations and supply-chain management.

The proliferation of certification schemes with different types of governance arrangements and power structures, reflected in differences in the stories that the schemes communicate to the market concerning the product, is a matter of concern to some actors. On the other hand other actors consider this to be the nature of a market based governance instrument, and that in the absence of an agreed scientific definition of SFM there are benefits in having a variety of schemes. Mutual recognition is one possible way forward, but requires a lengthy process of discussing the underlying values, goals and interests of stakeholders involved in the various schemes to build mutual trust and understanding. It has been promoted especially by the forest industry, but objected by many environmental NGOs who see it as an attempt to weaken the standards.

As is the case with the FLEGT, certification is a forest governance tool that works only in the case where timber/forest product imports to “environmentally sensitive” markets play a major role in forest use. The shift of trade patterns, especially as regards tropical timber and forest products, from the more sensitive European and US markets towards the less discriminating Asian markets, as has been clearly shown in the earlier parts of this study, may – at least in the short term – restrict the impact of this model of forest governance. Another major issue regarding the effectiveness of certification as a governance tool is that most of the certified forests are actually in the countries where forest governance is best developed even without certification. A recent study by ITTO (ITTO 2000) found out that less than 8% of the world's certified forest area is in the tropics, i.e. the ITTO member producer countries. This is seen, at least partly, to reflect the lower capacity of the actors in the tropical countries as well as the higher complexity of the situations on the ground. A step-wise approach has been proposed but this has not so far been accepted by some key actors, notably the NGO community as it is seen to erode the credibility of certification.

Certification is recognized as a potentially important tool for forest governance also by the World Bank in its Forest Policy (WB 2002), which sets out certain qualitative requirements for such systems, as well as within the ‘status quo’ report of the WTO prepared for the Cancun meeting. A key question linking certification as a governance tool to the global trade governance dialogue at the WTO is the uncertainty on whether the certification schemes will be considered to constitute technical barriers to trade under WTO rules, or whether labeling based on process of production methods (PPM) is allowed.

6.5 How to harness trade to create enabling environment for SFM?

6.5.1 Introduction to Governance Issues for an Enabling Environment

The potential of trade to contribute towards creating an enabling environment for SFM is especially contingent on:

- the success in identifying and mitigating the potential negative impacts of trade liberalization of agricultural products
- the results on the WTO negotiations regarding trade and environmental linkage, especially as regards market access and certification and labeling,
- the development of global markets for forests’ environmental services, and the success in integrating the production of these in SFM,
- the capacity of the governments, civil society and private sector to negotiate acceptable and enforceable solutions to the major governance related issues, both within the sector and regarding the major extra- sectoral issues (i.e. the success in establishing national forest programme type processes in countries), and
- the success of the FLEGT type initiatives in contributing towards curbing illegal logging and trade in illegally harvested timber

The factors counteracting these include the increasing share in the global markets of exports to countries with less environmentally sensitive markets, and the increasing share in foreign direct investment in forest industry capacity of companies and financing institutions with less stringent environmental and social safeguard requirements. One of the key challenges is to expand the reach of both the international government and civil society led forest governance related processes and mechanisms towards these actors.

Option to the above:

Effectively harnessing trade for SFM is contingent on three major issues:

- linking SFM with macroeconomic reform/development processes and programs to mitigate negative impacts on SFM and create synergies,
- creating the enabling conditions to attract socially and environmentally responsible foreign direct investment, and
- securing the ownership/and tenurial rights on forest lands through negotiation processes recognizing the divergent interests of different actors

6.5.2 Macroeconomic/Fiscal Reform/Development Processes and Structural Adjustments

Trade related and other measures defined in the adjustment processes supported by the IMF and the World Bank may impact negatively on SFM. This is the case regardless of whether these are implemented in countries in transition and/or middle income developing countries, or in the context of the HIPC related PRSP processes in the LDCs. These processes, especially the elaboration of the policy matrix, are heavily steered by the IMF/WB staff in close collaboration with the Ministries of Finance of the partner countries, with limited involvement of the technical ministries, such as the ministry responsible for forestry. Even in the case of the PRSPs it has been noted that there is no fundamental departure from the kind of policy advise espoused under what has come to be know as the “Washington Consensus” (UNCTAD 2002).

To tackle this issue, the Bank has proposed in its Forest Strategy and Operational Policy (World Bank 2002) that specific measures should be taken to systematically address extra-sectoral policy, institutional and structural issues that have particular influence on forests. This is the case especially regarding the operational policy governing the implementation of structural adjustment programmes. In the context of the PRSP processes more inclusive and participatory ways of looking into these issues from the point of view of the poor – including the forest dependent poor – are emerging through participatory poverty assessments. In some cases, also linkages between the PRSP processes and national forest programme processes are visible (Oksanen and Mersmann, 2003). However, it is evident that the adjustment operations, whether linked to PRSPs or not, still tilt the balance of power in negotiations towards the international financial institutions and the ministries of finance, at the expense of the technical ministries and civil society actors.

6.5.3 Interactions between Foreign Direct Investment and Governance

Foreign direct investment is attracted to countries offering good returns and at least a relatively stable governance environment that protects the investor from risks. This translates into attractive raw-material and labor costs, relatively good infrastructure (roads, electricity, harbors etc.), security on (forest) land tenure/ownership, legislation protecting the investor and providing a favorable overall investment climate, and governance capacity to enforce such legislation. Increasingly, with the globalization of forest industries and their markets, trans-national corporations are also concerned about the impact of social and environmental factors on their markets as well as on potential investors. The same concerns are shared by financing institutions and institutions providing investment guarantees. Socially and environmentally responsible investors do not any longer see meeting the requirements of e.g. voluntary environmental management systems (such as ISO 14 001/EMAS and certification) as an obligation. It is increasingly perceived as part of their long-term strategy of staying in the business and meeting the expectations of various stakeholders.

This concern has created new kinds of partnerships and alliances of industry, financing institutions and environmental and social NGOs working jointly to mitigate social and environmental risks and achieve positive outcomes. Examples of these partnerships include at the international level the Global Forest Watch, the Forest Integrity Network and the WWF-World Bank Alliance. The Bank has also had an active role in fostering this kind of dialogue and partnerships, as evidenced by the Forest Investment Forum hosted by the Bank in Washington in October 2003. The Forum organized by the WB together with IFC, WBCSD, WWF, Forest Trends, and PROFOR brought together representatives of trans-national forest companies, financing and development agencies, and NGOs and policy research institutions to discuss opportunities for SFM.

At the national/local level these new partnerships include different types of arrangements between industry, local communities and NGOs. The types of schemes that have been negotiated between the partners include outgrower schemes, corporate social responsibility projects, joint ventures, farm-forestry crop share arrangements, co-management schemes and cooperative business arrangements and forest services contracting (Mayers and Vermeulen 2002)

6.5.4 Ownership and Control of Forests and Socially and Environmentally Acceptable Solutions

Many of the important issues regarding trade impacts on forest governance revolve around the issue of ownership and control of forest lands. Such questions arise as: if increased trade pushes up the demand for

timber how will it impact on the customary land use rights of forest-dependent indigenous groups? Will it lead to increased illegal logging, followed by migration and colonization of logged-over forest areas, and consequent change in land use? Will it lead to conversion of marginal agricultural lands back to forests or timber plantations – or will the increase in trade of agricultural products offset this and lead to increasing conversion of forest lands to agricultural use? Under what conditions can the net result be more profitable and better-managed forests providing a continuous stream of benefits to local communities, and stabilizing the agricultural frontier?

As has been demonstrated in the previous chapters, there is no single answer to these questions. The net impact on SFM of increased trade of forest (and agricultural) products will depend on whether we are talking about managed forests, degraded open access forests or unmanaged forests at the forest frontier. It will also depend on the clarity of the customary and/or legally defined ownership of the forests, as well as the capacity of the owners to enforce their rights. In many situations, especially in the developing countries, the definition (whether by law or custom) of the ownership and control of forest land is weak or subject to different interpretations by different groups of actors. A drastic change in the demand for timber – as well as a change in the relative profitability of forest based production in comparison with other alternative land-uses – is likely to impact on the interest and balance of power between these groups. It is also likely to have an impact on environmental outcomes and sustainability. In the developing countries it is likely that short-term economic benefits and interests will dominate over longer-term concerns over sustainability of land use. To manage these complicated societal processes, specific attention needs to be paid to establish processes that help to negotiate socially and environmentally acceptable solutions to these complex issues.

The national forest programme processes offer one potential platform for negotiating such solutions. Practice has shown, however, that these tend to function only when the underlying policy and legal framework on land ownership and tenure has been properly established, and when the society at large has the governance capacity to enforce these properly. From the forest sector point of view this is perhaps the most critical cross-sectoral issue that needs to be taken into account when planning for forest development.

6.6 Conclusions on Trade, Governance and SFM Interface

6.6.1 Trade Liberalisation as a 'magnifier' of Forest Governance?

One of the major conclusions of this chapter is that the impacts on forest governance of trade liberalisation are positive where there is already good governance (a virtuous cycle), and negative where governance is weak (a vicious cycle). Thus, trade appears to be a magnifier of *existing* policy and institutional strengths and weaknesses rather than a major driver of forest governance change.

Trade-governance impacts depend on what else is in the package, e.g. state downsizing, decentralisation, deregulation, privatisation, concession bidding and forest taxation, and the capacity and will of the government to implement it. The way in which trade policies interact with these changes determine whether they improve or reduce governance capability:

Transparency and reduced corruption and rent seeking - evidence mainly supports the contention that reducing trade restrictions reduces public sector corruption as long as there is strong regulatory and institutional backup. Where windfall resource rents occur the converse may be the case - and in some situations trade liberalisation may not bring about a real reduction in corruption - merely a change in the pattern of winners and losers.

Pressure for improved policy and regulatory frameworks - for most developing markets, existing regulatory capacity is too weak to control external demands on the resource and a likely outcome of trade liberalisation is an increase in unregulated logging. Trade liberalisation should therefore be preceded rather than followed by institutional strengthening.

Responsible behaviour of transnational companies. On the one hand more trade by TNCs may generate wealth through trade which may provide the basis for improved governance. On the other hand, there is a tendency for more exploitative TNCs to target weaker governance structures. The evidence is mixed.

Capacity to internalise externalities - forest revenues tend to be squandered when trade liberalisation is accompanied by a structural adjustment programme, deregulatory reforms and / or privatisation, and when governance is not already sound.

6.6.2 National Preparedness and Capacity to engage in Dialogue on Forest Trade Issues

The effectiveness of processes at the national level to engage with trade issues and harness the benefits of freer or more controlled trade for forest management determine to a large extent how and in which direction this magnifying effect will work.

A basic characteristic of the institutional architecture in many countries is that the people who deal with forestry and the people who deal with trade do not see much of each other. Not many forestry departments around the world are very good at managing and negotiating issues of forest trade. Whilst many are highly competent at engaging with elements of the trade chain - forestry production, forestry revenue systems, export restrictions and the like, few are used to dealing with investment needs, trade transactions, macro-economics and import restrictions (Mayers & Bass 1999). Similarly it is difficult to find examples of countries where debate on trade liberalisation has been the key lever to open up forest sector planning and the development of strategic ways forward like national forest programmes. However, in Papua New Guinea, concern about the “robber baron” timber companies freed up to roam the southeast Asia-Melanesia region by liberalisation, was at the heart of the Barnett Inquiry of 1989 which was a key early milestone in a decade of forest sector reform in that country (Filer 1998).

But more positively, trade liberalisation has certainly stimulated the rise in profile and capability of the private sector and civil society to engage on forest trade issues in a range of countries – the former in general to seize opportunities, the latter in general to protest at abuses. In Brazil, the private sector has improved its collective organisation and representation capacity, whilst the threat of Asian investment invasion stirred up civil society attention on illegal logging, thereby catalysing some key governance improvements. In several African countries, much of the identifiable shift towards more responsible and accountable systems of governance, and more effective environmental regulation, have been in response to the demands and protests of African civil society, according to Reed (2002).

In addition, in some countries liberalisation appears to have had the effect of bringing key government agencies together, e.g., the permanent secretaries and technical advisers in forestry and economic ministries. In Mexico, trade liberalisation ‘shook up’ governance systems and focused attention on the problems which needed new skill and will to fix. In Ghana, discussions of whether and how to introduce, remove or modify log export bans and levies have brought key government agents together over several years (Kotey *et al.* 1998).

Stimulated by the problems of illegal logging, multi-stakeholder groups in a range of countries in Asia, Europe and Africa are currently investigating how to improve: legislative instruments and the capacity to implement them to prevent the trade of illegally produced forest products; increased use of the Convention on International Trade in Endangered Species (CITES); and the potential of multilateral agreements like the 1999 OECD Convention on Combating Bribery of Public Officials in International Business Transactions (Brack *et al.* 2002a, 2002b). Although the stimulus for these groups has generally come from donor agencies, in some cases at least local motivation is high.

Greater involvement of TNCs and the generation of wealth from increased trade may provide the basis for improved capacity for thinking about and shaping forest trade to a country’s benefit. Company-community forestry partnerships can be a vital complement to effective local governance decision-making (Mayers & Vermeulen 2002). But greater involvement of TNCs as a result of trade liberalisation may lead to a greater handover of governance decision-making to TNCs, and constrain national capability and preparedness. This is because some investment agreements between TNCs and sovereign states are more than contracts – they are in effect laws written to ‘regulate’ the projects being implemented – and often run counter to other laws of the land (for example, where they confer special forest exploitation rights, waivers on monitoring, rights to move people from the land, exemption from liabilities, etc) (Leubuscher 2003). Not only does this hinder the development of national capability, but the submission of governments to arbitrary rules set by TNCs may prevent them from carrying out reforms such as land tenure which could provide far greater national wealth (de Soto 2000).

Information is vital for transparency and civil society participation. Capital markets have been found to be sensitive to environmental information which can be used to empower pressure groups, like environmental NGOs (Fredriksson 1999). Summarising a wider literature, Andersson *et al.* (1995) report that the more reliable and available information on a company is, and the easier it is for consumers to evaluate companies, the more sensitive they become to their environmental image. Information provision goes hand in hand with measures to increase public participation in forest governance, for example, public monitoring of forest management audits.

At the international level improved coordination between the trade and forest related processes is needed to ensure that the effects on forest governance are supportive to SFM:

Country delegations to WTO and regional trade organisations have tended not to have forestry expertise (Bass 2003), nor has there been sufficient coordination between the trade related international dialogue and the international forest related processes. The Special Sessions of the Committee on Trade and the Environment and meetings of the Committee on Technical Barriers to Trade are beginning to be the exception, but much important work in areas such as the Committees on Subsidies and Countervailing Measures and Negotiating Groups on Market Access proceed without the benefit of forest sector expertise from developing countries. Neither have trade issues and impacts on SFM been systematically and broadly addressed in the international forest related processes.

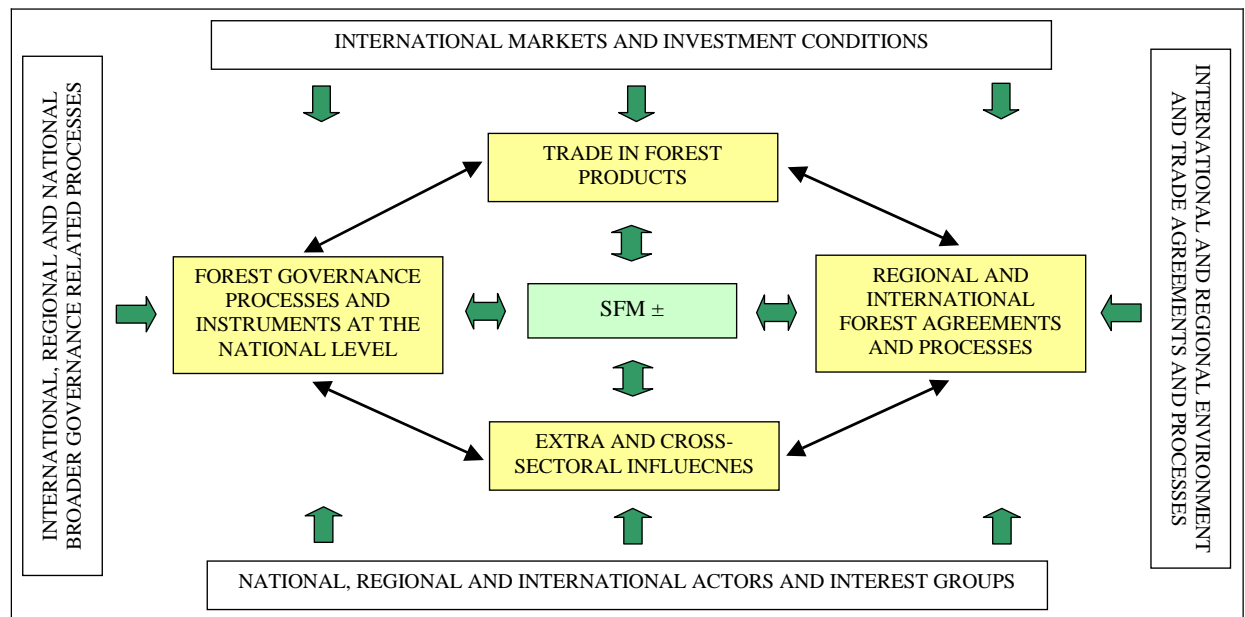
In addition to providing a basis for improved trade-SFM policy coordination, international/regional action can have also a key role in facilitating and supporting more effective action at the national level. The following issues are especially important to ensure that a “virtuous cycle” of trade-governance-SFM impacts is achieved at the national level:

- capacity building for developing countries to enable effective governance responses with right sequencing and timing to trade related SFM impacts, both to make most of the positive impacts and to mitigate potential negative ones
- international cooperation on controlling illegal logging as a priority international governance related action, including also regional processes and bilateral processes between important producers and consumers
- assessment of potential negative forest governance impacts in the context of SAP/PRSC, design of effective measures to mitigate these must be included in the PRSP processes
- need for effective inclusion of trade related issues in the international processes and instruments dealing with SFM
- need for improved coordination between international trade related processes and international forest dialogue

6.6.3 Other Factors of Impact at the Trade-SFM Nexus

Finally, it needs to be borne in mind that trade related issues only have a limited impact on forest governance, and through it to SFM. In general, non-trade factors appear to have more influence on the quality of forest governance. As with trade related issues forest governance in turn acts both as a magnifier of the impact of many of these factors on SFM, and as a counterbalance to some of the potential negative impacts. In the final outcome, changes regarding these factors may be more important means for improving forest governance and through it SFM. The following figure makes an attempt to put forest products trade - forest governance impacts on SFM into the context of some of these broader issues.

Figure 6.4 Forest products trade and forest governance in the context of broader issues impacting on SFM



Many of these impacts, including those of forest products' trade are fully or partly location specific, and a meaningful assessment can only be made at the country level.

Certification has the potential to affect trade patterns as it implies discrimination between producers according to whether they are certified. This has been reinforced by the formation of buyers groups in various countries with collective objectives to phase out the sourcing of timber from non-certified sources. However, the predominant approach adopted by buyers has been to work with existing suppliers to encourage them to achieve certification. Although some suppliers have been dropped because of failure to respond, this has been rare (Bass *et al.* 2001). Certification has had most impact on retail sectors such as DIY or home improvements where there is a close link to the consumer. In particular, it has enabled suppliers in developing countries to get access to new markets. The need to find sources of FSC-certified tropical timber led to the UK DIY retailer, B&Q, considering Bolivian suppliers for the first time because they were certified. For the sectors which are major users of wood materials such as construction but where the link with the end user is more tenuous certification has had less impact so far (Bass *et al.* 2001). Certified wood and paper are still niche markets. For these reasons, certification on its own has probably had little impact on trade patterns in aggregate. However, the combined effect of certification, boycotts, campaigns, and procurement initiatives is likely to have affected trade patterns for tropical timber.

The evidence also supports the contention that tropical timber is increasingly switching to indiscriminating Asian markets¹³⁴ as a result of its substitution by northern temperate timber on the European market (Karsenty 1998). For example, African producers like Gabon and Equatorial Guinea used to export timber exclusively to Europe, but by 1996 most of their exports were going to China and other parts of Asia (Sizer and Plouvier 1998).

As a result, there is considerable concern over the potential trade-restricting impacts of certification on developing country producers. Certification is most readily applicable by producers who are in the third stage of forest development (where costs of management are already offset by the high value of forest products). This is reflected, for example, in the high take-up of certification in the Nordic countries. By way of contrast, less than ten percent of Indonesia's annual harvests come from managed forest plantations and most of its timber markets are characterized by the first two stages of forest development where sustainable management is not yet financially viable. If certification becomes more widespread it is likely to raise the value function of forests in developed countries at the third stage of forest development at the expense of forest values in developing countries, where the additional costs required to secure land

¹³⁴ Asian markets accept a wider range of species, smaller logs, and lower quality timber than northern markets (Sizer and Plouvier, 1998).

and attain certification standards are formidable. This will shift the balance of trade in favour of developed countries.

Although most certification schemes are voluntary, there is uncertainty over whether they constitute technical barriers to trade under WTO rules. The key issue is the compatibility with WTO rules of labelling based non product-related processes and production methods, the type of forest management in the case of certification. The Committee on Trade and Environment of the WTO was instructed under the Doha Ministerial Declaration to give attention to the effect of environmental measures on market access and labelling requirements for environmental purposes and to report to the WTO Ministerial Conference in Cancun. However, it is clear from the CTE's report that there is still little consensus on this issue with some members of the view that existing WTO disciplines such as the TBT agreement are adequate to deal with the issue of environmental labelling, and others believing that there is a need to reach some common understanding, interpretation or guidance with respect to labelling requirements (CTE 2003). Moreover, the report states that the differences of views on PPMs remain.

Uncertainty over a potential WTO ruling could be having a negative regulatory effect, since the confidence of governments to promote certification and eco-labelling as an incentive for regulatory compliance is tempered. According to Sizer *et al.* (1999), the WTO uncertainty could even deter countries from introducing stricter forestry regulations, as the latter could also be interpreted as a trade barrier. For example, recent revisions to the British Colombian Forest Practices Code, which raised the cost of harvesting, were included in a list of NTMs in the APEC (2000) study.

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Underlying these market access concerns is a view that voluntary certification schemes may become in effect compulsory if some of the dominant retailers in an increasing number of developed countries seem unwilling to carry uncertified products (Bourke 2002). Further issues are raised if certification is used as a criterion in government purchases. This is discussed further under public procurement.

Supply-chain Management

Some large companies have established systems to trace the source of the wood they use and to ensure that it has been harvested from well-managed forests. This has usually been in response to NGO pressure or bad publicity about one of their suppliers. In some cases this approach has been a forerunner of moves to require suppliers to achieve certification. The UK DIY retailer B&Q, after high profile NGO campaigns linking European consumption to tropical deforestation in the late 1980s and early 1990s, stated publicly that it would buy no more tropical hardwoods from Brazil because it could not be sure of its source. Its next step was to develop systems for tracing the sources of all its wood-based products. This was followed by a policy of persuading its supply base to become certified (Bass *et al.* 2001).

Socially Responsible Investment

Environmental niche markets for forest products are growing – in Europe and North America in particular, although social niche markets remain small. These markets are increasingly shaped by 'soft law', such as certification, which is scrutinised by civil society. Product chain-of-custody information is also becoming increasingly important as buyers, manufacturers and producers attempt to send signals through the supply chain about market demands and sustainability.

Until recently the social responsibility of a major forestry company ended with its formal obligation to pay royalties and taxes and perhaps cash compensation to communities for lost assets, a few jobs and perhaps the construction of schools and health clinics. Yet a few big companies involved in forest trade are paying more attention to a wider group of stakeholders. It is widely claimed that companies practising corporate social responsibility have a number of financial benefits which ultimately affect the returns and risks for investors. Typical arguments include:

- *Secure markets* - compliance with environmental and social standards can secure markets and occasionally secure higher prices;
- *Changes in legislation* (e.g. tightening regulations) or changes in rules on liability for damage can imply significant costs and companies that can prepare for regulatory change will have a competitive advantage;
- *Less risk* - Companies with good environmental and social performance will be perceived as less risky by financial markets, reducing capital costs and insurance premiums.

- *Clean technologies are usually more efficient.* Similarly, good working conditions can lead to higher productivity and fewer union disputes and make it easier to attract and retain employees;
- *Public reputation* - this can affect the company's social licence to operate, reducing the time required to secure government approval of, and community support for, new developments or expansion.

In many developing countries, the first two factors are less relevant as enforcement of legislation is weak and consumers are interested primarily in price and quality alone. So the argument hinges on the financial implications of company reputation at local, national and international level.

Institutional investors, pension funds in particular, now own a significant proportion of the shares in listed companies. This allows some influence over the way these companies are run. Socially responsible investment (SRI) funds which cater to investors who want to invest their money and meet environmental and social goals at the same time, have a number of strategies. They can operate by screening out companies that do not meet certain criteria, or by discriminating in favour of companies that are engaged in sustainable activities or by using their influence as shareholders to encourage companies to change their behaviour and to raise their awareness of certain issues. This last type of approach is the growth area in socially responsible investment. The ethical funds established in the early 1990s excluded companies engaged in tropical timber harvesting from their investment portfolios. The introduction of forest certification schemes provided a criterion for screening in, not only of forest products companies but of end users of forest products. More recently, SRI investors have been engaging with companies around specific forest management issues, for example the conversion of tropical forest to oil palm plantations.

It is difficult to assess the impact of SRI funds on forest product trade patterns and forest management. In general, this type of fund invests mainly in established companies listed on developed country stock markets and invests very little in developing country companies. They are unlikely to invest in or have much influence on companies engaged in natural forest operations in the tropics. As the forest sector globalises and foreign direct investment increases their influence is likely to grow. At present, they are important as one of a number of factors which together will influence company behaviour. The South African forest products company, Mondi, was affected by the London listing of its parent company, Anglo American. This introduced stronger pressure from shareholders and more stringent reporting and disclosure requirements. This increased investor scrutiny was one of a number of factors which in addition to market pressure, prompted Mondi to seek FSC certification for its forest operations (Mayers *et al.* 2001).

More direct impact can be expected from socially responsible venture capital funds which provide larger amounts of capital for company startups and expansions. Specialist Timber Investment Management Organisations (TIMOs) raise money from institutional investors to manage a portfolio of forest properties and are important players in the US. As timberland investments tend to move countercyclically with stocks and bonds they constitute an effective way for institutional investors to diversify and reduce risk. These organisations typically adopt a policy of sustainable forest management and several of them are looking beyond the US to investments in emerging markets. For example, the investment made by GMO in the company Gethal in the Amazon, Brazil, was conditional on a strategy to obtain forest certification. However, investment by the TIMOS in natural forest operations in the tropics is relatively rare. Their preference is for plantation forests in temperate countries with low political risk. UBS Timber Investments which manages over US\$ 1.3 billion focuses on Argentina, Australia, Chile, New Zealand and Uruguay.¹³⁵

¹³⁵ www.ubsbrinson.com/timber/index.html

Conclusions

Chapters and Sections:

7. Impacts of Trade on Forest Management

7.1 Influences on the trade and forest management relationship

7.2 Ways forward

8. CONCLUSIONS

7. Impact of Trade on Forest Management

(to be expanded and revised after review and comments)

This chapter presents conclusions on the impacts of changes in trade patterns and trade policies, in particular trade liberalisation, on aspects of forest management. It covers the trade factors beyond the forest sector that influence whether forest management is even an option, then goes on to consider how expansion of trade affects environmental, economic and social aspects of forest management. Conclusions are then made on the impacts of trade on forest governance. Finally, we identify some of the key approaches to understanding and improving trade impacts on forestry which deserve attention in future.

Before jumping to such conclusions, however, it is necessary to highlight a few provisos – concerns, qualifications and potential sources of confusion - in making definitive statements about trade impacts.

Disagreements over trade impacts are at least as frequently based on people talking at cross-purposes as they are based on disagreements of substance. The following areas of confusion often creep, unrecognised, into trade and forestry debates:

Two-way causality between trade and forest governance. Policies and institutions determine and influence patterns of trade, whilst the scale and dynamics of trade can influence the nature and quality of forest governance – we suggest that in most situations both forms of causality can be expected

Level of aggregation at which to assess trade impacts on forest management – we suggest that it is necessary to focus on the landscape level. A trade effect on forest degradation at one or more forest stands tells us little, and is often counteracted by positive effects at others

Regional differences in trade trends and their impacts. In a fundamental sense, all contexts are different and conclusions need to be made specific to particular places and times. However, a certain level of generalisation about trends and impacts is valid - we suggest that it is crucial to distinguish between regions, particularly in terms of growing conditions, commercial richness and accessibility of forests

Stage of market development plays a critical role in defining the type of forest activities that prevail and the impact of trade on the economic viability of these activities. With the same proviso as above about context-specificity - we suggest the need to distinguish, at minimum, between three stages of market development: new forest frontier, developing frontier and mature frontier.

But there is a more fundamental confusion in many disputes over the impact of trade on forests. For the same trade-forest interaction, there may be categorically different but equally legitimate perceptions of the problem and the desired solution. Trade impacts may thus have different explanations. This is illustrated in table 10.1.

Table 7.1 Different explanations of what to do about a particular impact of trade liberalisation

Perception of Problem	Response
1. The theory espousing benefits from free trade is wrong	A complete rethink of trade liberalisation
2. Trade is not sufficiently free, nor markets sufficiently perfect to generate predicted benefits	Remove remaining trade restrictions and distortions, and implement measures to counter market imperfections (e.g. internalise externalities, break monopolies)
3. There are benefits at an aggregate level but not sufficient to compensate disadvantaged groups	Remove remaining trade restrictions and distortions, implement measures to counter market imperfections, and introduce compensation mechanisms to ease adjustment for those who lose
4. Economic benefits of trade liberalisation are outweighed by social and environmental costs	Restrict trade in order to protect social or environmental values.

The above table illustrates an important fact that, when discussing impacts of trade, differences in opinion are to be expected. “Who is right?” ultimately is a less important question for understanding outcomes than “who matters?” The outcome of trade debates is currently decided more by the relative power of interest groups than by the strength of their arguments.

The areas of confusion described above have been unpacked in preceding chapters. The point in reiterating them here is to qualify the conclusions made in the following sub-sections. In short, each of the following conclusions is only as strong as the degree to which the above areas of confusion are sorted out.

7.1 Influences on the Trade and Forest Management Relationship

The impacts on forests of trade in non-forest sectors are dealt with here. This is a huge subject and our conclusions are limited to a consideration of the extent to which such extra-sectoral trade reduces or enhances the prospects of beneficial forest trade.

Macro-economic stability is crucial. This is necessary for the long-term outlooks and investment fundamental to trade based on sustainable forest management

Costs of agriculture and property rights are fundamental. Different regions have different propensities towards sustainable forest management. The comparative value of forestry and agricultural alternatives and the cost of enforcing property rights, are crucial in determining this. Tropical forests of Latin America and some other regions are particularly disadvantaged in this regard

Liberalisation of agricultural trade has effects that dwarf those of liberalisation in the forest sector. Where agricultural intensification accompanies shifts in agricultural production, the net effects on sustainable forestry can be positive.

Forests and forest-based livelihoods are also strongly affected by the serious inequities which prevail in international institutions governing market structure and competition, trade rules, barriers and disputes in the many sectors which compete with or involve forestry. Because of this, we conclude that the theory behind mutual benefits to trading partners is unlikely to be predictive for less powerful interest groups or forest types within many tropical nations.

Environmental impacts

In general terms, forest trade benefits the environment of the importing region whilst the exporting region environment is degraded. However such effects are ambiguous, both in the sense that they may cancel each other out in terms of overall sustainability, and to the extent that within each region there are often areas with positive impacts and areas with negative impacts at the same time. Some of these impacts can be summarised as follows:

Different forest types – different effects. Different forest types and their relative competitiveness are affected by trade changes in different ways. In regions with natural advantages in location, forest composition and growing environment higher export prices raise forest land values against agricultural alternatives and the cost of enforcing property rights and make SFM more economically viable. For regions without such advantages the converse may be true.

Accessible forests first. Changing patterns of trade will affect valuable and accessible resources first, although the longer-term impacts on other types of forest resource may be equally profound.

Growth in production in exporting regions. Trade stimulates production for export which may result in more forest degradation in natural forest areas or more profitable managed forest or both, depending on the stage(s) of market development of that region.

Reduced forest harvesting in importing regions. Trade reduces harvesting in importing countries although net forest degradation may increase if there is displacement of former forest employees to subsistence alternatives.

Trade does little for biodiversity hot-spots. International trade alone is unlikely to protect or foster sustainability in isolated natural forest areas with the greatest biodiversity.

Plantations increasingly favoured by trade. International trade is accelerating the shift in supply from less competitive natural forests to intensive plantations (led by Asia) with high production per unit area. This shift may reduce both the total area of forest and the remaining area of natural forest.

Carbon markets unhelpful for SFM in natural forest. International agreements surrounding markets involving carbon storage currently favour plantations over natural forests in the provision of the Clean Development Mechanism and this will further undermine the economic viability of SFM in natural forests.

Whilst the impacts of trade on the forest environment are highly dependent on context, it can be further concluded that it is the wealthier countries that are able to gain positive environmental impacts from trade - by importing forest products from poorer countries and externalising the environmental consequences ('stamping their ecological footprint').

Impacts on economic aspects of forest management

Economically, the net effect of trade is always beneficial – it is the distribution of benefits and the way different benefits are accorded value by different interests that determine impacts in a given location. These impacts include:

Comparative land use value determines impact. International trade impacts forests most when it leads to changes in the value of forest goods and services relative to other land uses – for example as international competition drives forest product prices down or raises the value of alternative export crops like soybean in exporting nations.

Comparative advantage is declining in tropical regions. International trade has resulted in a general deterioration of the forest trade balance, and comparative forest values for tropical regions over time. Trade expansion is occurring in highly processed sectors where the scale and speed of investment in technology and information are more important competitive assets than available land and labour.

Domestic trade emphasises quantity, international trade influences quality. For all regions and most countries, especially in the tropics, domestic trade is still more important in volume terms than international trade. International trade therefore drive qualitative changes - processing standards, product designs and the like – more than production volumes in many countries.

Mature stages of market development favour SFM. Trade based on SFM is most likely to be economically viable, in areas in mature stages of market development and in plantations rather than natural forests. Trade derived from natural forest frontiers is inherently less sustainable than trade based on managed forests close to markets due to costs of enforcing property rights in such isolated areas.

Some industrial consolidation may favour SFM. Excess capacity in processing and low profitability can work against SFM, particularly in natural forest. Rationalisation of the industry may enable a more competitive sector based on SFM.

The economics of SFM in natural tropical forests is a much-debated subject. In the sense of producing a sustained yield of timber, SFM in the tropics is not only less profitable than other uses to which the land may be put; it is less profitable than tropical plantations or the sustainable management of temperate forests. The challenge in future for remaining tropical natural forests will be to find the economically sustainable ways in which trade can enable timber to be managed as an accumulating capital asset alongside other forest values.

Social Impacts

As for environmental sustainability, trade's net effect on social sustainability is always ambiguous and is usually positive in some areas and negative in others at the same time. Some of these impacts can be summarised as follows:

Balance of employment favours exporting nations. *Increased trade causes growth in production and employment in the exporting region, which may result in social benefits depending on the quality of that employment.*

Consumer welfare improved in the importing region. *Importing regions gain in consumer welfare with trade, but may lose forest production and employment.*

Smaller and weaker producers marginalised. *International trade pits localities and enterprises against each other. Large companies that can exploit economies of scale can benefit from market expansion. . Small-medium and less powerful enterprises – which are often vital for local livelihoods through employment and local economic multipliers - tend to lose out.*

Social irresponsibility and illegality thrive in low wage contexts. *Poor social and environmental practice predominate amongst exporters in countries where wages are lower and labour is the largest component of logging costs - primarily because the return to such activities is greater than the opportunity costs or the risks of apprehension.*

One of the major advances in understanding about SFM in recent years is the importance of engagement in decision making of all those who have a practical stake in, or influence over, the future of the forests. On balance, trade tends to concentrate decision making over forest management, rather than spreading it amongst these interests, which threatens prospects for long-term sustainability. This takes us towards forests governance - to which we now turn.

Impacts of Trade on Forest Governance

Cause and effect in trade, governance and environment relationships are notoriously interwoven (see below). However some conclusions are possible. Here we focus primarily on trade impacts on governance in developing and transition economies, although some conclusions have validity across industrialised economies also:

Impacts of trade policies on forest governance are generally indirect, often weak and sometimes perverse. *There is little solid empirical evidence to support arguments that trade liberalisation directly reinforces or undermines forest governance. In general, non-trade factors appear to have more influence on the quality of forest governance.*

Trade is a magnifier of existing governance strengths and weaknesses. Both freer trade and trade restrictions can make things worse if underlying policy and institutional failures are not tackled. But trade liberalisation can stimulate a ‘virtuous cycle’ if the regulatory framework is robust and externalities are internalised. This highlights the two-way relationship between trade and governance changes – trade changes governance, which changes trade, which changes governance.

Impacts depend on interactions with other items in the reform “package”. Typical forest sector “reforms” that often accompany trade policy changes include competitive tendering of timber concessions, higher forest taxation, decentralisation, privatisation and deregulation, etc. The way in which trade policies interact with these changes determine whether they improve or reduce governance capability.

Liberalisation on a weak regulatory base foments trouble. Trade liberalisation can have significant adverse impacts where the regulatory capacity to monitor and enforce compliance, including protection of property rights, is weak. For example, stumpage prices may rise or fall in the wake of trade liberalisation, but in either case there may be increased risk of illegal logging where regulatory capacity is weak; higher prices increase the returns to illegal logging, while falling prices make firms more inclined to cheat in order to cut costs and maintain revenues.

Liberalisation on a sound regulatory base ‘shakes up’ governance usefully. Trade liberalisation has forced government and other stakeholders in several countries with reasonably strong regulatory capabilities to focus attention on addressing some underlying problems (e.g. inefficiency/over-capacity in industry). Even in weaker governance situations this effect can be positive - liberalisation has stimulated the rise in profile and capability of the private sector and civil society to engage on forest trade (the former in general to seize opportunities, the latter in general to protest at abuses) – although a period of sub-optimal,

incoherent and mutually conflicting actions can be expected before effective negotiated improvements amongst these stakeholders emerges.

'Green' measures may shift governance problems to domestic and non-discriminating markets. International green market pressures and moves to prevent imports of illegal logs, may divert current exports towards the domestic market and/or less discriminating markets. Governance problems associated with lower-value domestic product markets are often more pronounced than for export markets and, in many countries, domestic markets are far more important in volume/value terms than exports.

Good news for one country may lead to bad news for another. Governance improvements in one country, especially if it is a net-importer, can increase pressures on forests and may even undermine governance in exporting countries (this impact is strongly felt in Southeast Asia in recent years).

More trade by trans-national companies may help or hinder governance. Generation of wealth from increased trade generated by TNCs may provide the basis for improved capacity for thinking about and shaping forest trade to a country's benefit. But greater involvement of TNCs as a result of trade liberalisation may lead to a greater handover of governance decision-making to TNCs which constrains the development of national capability. Furthermore the subservience of governments to rules effectively set by TNCs may prevent them from carrying out reforms such as land tenure which could provide far greater national wealth.

It can further be concluded that, as a means to improve forest governance, attempting to shape trade *per se* may be a relatively weak approach compared with actions such as strengthening democratic processes, sorting out tenure and creating equal access to forest markets. We now turn to such ways forward.

7.2 Ways Forward

Ways forward to better understand trade impacts

A major collaborative effort by a wide range of institutions is going to be needed to carry out the analysis, assessment and knowledge management required to improve and spread understanding about trade impacts on forest management. More specifically we recommend:

Participation in trade impact assessments. Changes wrought by trade in the multiple benefits of multiple land use systems across multiple interest groups demand pluralistic and participative approach to their assessment.

More sophistication. Assessment of trade impacts needs to become more sophisticated – to differentiate between impacts on different forest types, the relative competitiveness of those types in different stages of market development, and the distribution of impact costs and benefits.

Landscape-level approaches. Better practical methods are needed to assess trade impacts at landscape level – which is crucial to avoid misleading assessments based on stand-level assessments alone.

Consider impact on competing land uses. Trade analysis should accommodate the impact of trade on comparative land use values – the values of different types of forest land use and alternative non-forest land uses.

Focus on the disadvantaged. Studies of trade impact should give particular attention to contexts with least natural propensity for SFM as it is these areas which suffer the brunt of negative consequences.

Analysis of institutional equity and process in trade decision-making. Trade analysis need to focus more on understanding the relative strengths of different players and the influence of different types of information in the working of institutions and processes at national and international levels which define the rules of the trade game.

Ways forward to improve trade impacts

A range of measures in policy and practice can be identified as priorities for improving the impact of trade on forest management. We put forward the following recommendations as an agenda for debate. These recommendations will only become realistic ways forward when thrashed out and modified in specific contexts:

Improve engagement of “under-powered” groups in trade policy decision-making. Trade decisions should be based on active initiatives to circumvent ‘natural’ institutional pecking orders and barriers in increasing understanding between trade governance and forest governance players at national level. Forest management and forest livelihood expertise should be installed in relevant trade delegations. Public interest groups should be encouraged and assisted access information and monitor the impacts of trade policy.

Get the sequencing right. Trade liberalisation should be preceded rather than followed by institutional strengthening, in order to forestall the potential adverse impacts of production increases, technological shifts or other changes induced by increased trade.

Get the package right. Trade liberalisation should be integrated with, and generally follow, moves to make property rights more secure, to ‘internalise’ environmental and social externalities, to foster regulatory capacity, and to make civil society engagement effective and routine.

Sharpen the focus on governance of domestic markets. Given that export demand for tropical timber is generally falling while domestic demand continues to increase in producer countries, and given that domestic forest governance challenges are often greater than those in export governance in producer countries, efforts to improve the contents and processes of domestic market governance should receive priority – and can integrate the export component.

Support national forest programmes that are widely negotiated, well-prioritised and genuinely owned by capable local institutions can provide the framework and process for the other governance improvements highlighted here and aimed at ensuring that trade is derived from SFM.

Link trade to improved property rights. Protecting the rights and access of indigenous groups and the rural poor should be a complementary policy to trade liberalisation (through land delimitation, functional decentralisation and local management). Promoting more secure land tenure for these and other credible forest managers is likely to be the single most positive step towards ensuring that trade promotes sustainable forest management.

Install policies for equitable and efficient allocation of forest land. *Such policies, which include transparent and competitive bidding, need to provide for the incentives and regulations that promote accountability and favour responsible enterprises in forest management.*

Develop graded incentives for value-added processing which are more closely linked to SFM. Policies with some subtlety in increasing context-specific forms of value-addition can be more effective in promoting trade from sustainably managed forests than blanket measures such as log-export bans.

Prevent tariff escalation on processed products. Such escalation is directly contrary to the aims of trade based on sustainable forest management. It drives trade away from value added products and thereby diminishes the economic viability of sustainable forest management.

Develop credit schemes linked to SFM. When linked to evidence of a company’s sustainability (e.g. through certification) the provision of credit can provide a very powerful incentive for production and trade based on SFM.

Install forest sustainability and livelihoods thinking in agreements on trade in environmental services. Agreements on environmental services should pay greater attention to the functional needs of SFM and forest-based livelihoods – e.g. CDM provisions should cover forest management of natural forests, if the competitiveness of those forests is to be maintained in comparison with other land uses, and should rise in technological sophistication to be able to deal with mixed-landscape farm and community forestry.

Scale up certification and other demand-side voluntary initiatives to change markets as well as minds. Initiatives such as certification and labelling, supply chain management and product campaigns have enabled a relatively small number of trade players to improve already good forest management but require a major push to achieve substantial positive impacts on mainstream trade flows.

Find incentives for regional action. Given that governance improvements in one country often affect governance changes in other, often neighbouring, countries - regional approaches to improving forest governance are essential. The trick is to find the levers for genuine regional level negotiation. The Forest Law Enforcement, Governance and Trade (FLEGT) processes based on government-to-government agreements to tackle illegal logging and trade, are a potentially good model. As these processes evolve support will be needed for them to engage with some of the vital governance complements to law enforcement – they should also involve fundamental rights, institutional roles, policy sticks-and-carrots, and systems by which decisions are actually put into action and monitored.

Consider the case for protection to achieve the social component of sustainability. There are strong social and environmental externality arguments for protecting community forestry sectors and local-livelihoods oriented enterprise against external trade pressures.

Foster foreign investment in SFM in tropical natural forest to promote responsible business and trade. Development finance institutions and investment guarantee agencies need to proactively support good practice in tropical forestry and not avoid the sector altogether.

Considerable resources and creative support will be needed to address the kind of agenda spelled out above. Forest governance initiatives in weaker governance situations in particular will need substantial support to make the necessary transition to decision-making content and process that ensures trade supports sustainable forest management. We call on potential supporters to collaborate on this.

Best of all, of course, would be to find the ways in which development in countries north and south keeps pace with expanding trade. The ingredients required for this such as the reduction in huge northern agricultural subsidies, investment in technology etc. lie far beyond the power of actors in the forest sector, or indeed beyond the world of trade policy. However, experience suggests that when actors within a couple of 'sectors' get together and push for the kinds of changes highlighted above, they can surprise themselves with what can be achieved.

8. Conclusions of the Overall Analysis

Any analysis of the impacts and interaction between trade in forest products and services and sustainable forest management is highly complex as it needs to address a vast variety of influencing factors. Most importantly, major stakeholders in forest management and in trade of forest products and services lack sufficient access to information and research as well as the means to arrive at a higher degree of mutual understanding and consensus.

There are major disagreements between stakeholders, including governments, on the causality between trade and forest management in view of the importance of either trade in forest products and services or sustainability in forest management. While one faction underlines the fact that without market access, liberalised trade and non-discrimination of timber and wood-based products any development would be at pairs, the faction in support of social and environmental safeguards for forests interprets trade dynamics and effective market development as a panacea which needs efficient limitations. Both factions are aware that expansion of trade is continuing at a high speed and that it is time for better governance at all levels as to arrive at more positive impacts and interaction.

The fragmentation of the international regime on trade and environment, including forests, seems to be reflection of this debate. The variety of institutions and instruments in place, the number of processes and initiatives has the potential to overcome the notion at the international level that trade in forest products and services can not and should not drive the policy agenda for sustainable forest management, unless major non-tariff barrier effectively limit trade and discriminate one products over the other because of their origin. While in many WTO agreements and regional trade agreements environmental concerns, including those on forests, are addressed, the "chill effect" is strong on trade policy makers turning away from the rather difficult subject of sustainability in the forestry sector.

The analysis of dynamics, trends and determining factors for trade and markets for forest goods and services has shown that indeed the forestry sector and wood processing industry is less subject to global trade negotiations under the umbrella of the World Trade Organization (WTO) whose mandate is basically limited to support the decrease of tariffs and tariff escalations for processed products rather than addressing non-tariff measures. With the exception of phyto-sanitary measures and technical barriers to trade, the WTO addresses important issues for the debate on trade and SFM like public procurement and product labelling. These issues are, however, only the consequence of the concerns over sustainable forest management. It can therefore not be expected that the WTO could be instrumental to assist in solving the most fundamental problems in the trade-environment nexus, including trade and SFM.

While tariffs play a decreasing role in trade of forest products and only substantively limit trade dynamics in a few countries, non-tariff measures of various nature are being applied by governments to support the domestic forestry sector and more specifically their domestic forest industries. This holds true for some of those countries with a high degree of plantation forestry as well as for some countries with an important natural forest resource. Consequently, there are quite differing views on how to foster sustainable forest management and/or support domestic forest and processing industries as well as community forest production. There is little information exchange, however, on the justification and effectiveness of non-tariff barriers like export restrictions and quota, subsidies and fiscal incentives, other incentives like infrastructure or even payments for environmental services of forests.

On the side of the consumers, major initiatives and market-based instruments have been developed. While campaigns and boycotts particularly in industrialised countries have not yielded the expected results at the origin of forest production in developing countries, certification of forest management and labelling of wood-based products have given rise to high expectations. Besides the fact that competing certification schemes have difficulties to achieve an effective consumer confidence in the market place, the overall dynamic in support of forest certification has widely influenced standard setting and implementation, governmental criteria and indicators for sustainable forest management as well as forest policy making. Insofar, certification initiatives constitute more than a tool for improvements on forest management in a given forest. This fact and experience should be taken into account when analysing forest certification and wood-based product labelling as a market-based instrument.

Quite clearly, the change in regional distribution of markets and trade patterns is accelerating due to the rapidly increasing demand in the commodity of timber, for example in China. However, the increased pressure of the international community on countries to move towards sustainable forest management has caused a shift towards non-discriminating markets which are less sensitive for social and environmental concerns. This trend to divert needs to be taken into account as to engage major stakeholders of those markets in the debate on sustainable forest management and trade.

The overall trend towards plantation timber, in particular fast-growing exotic species, has caused an important imbalance in the establishment of forest resources. The majority of developing countries and a number of countries with economies in transition are not subject to international or domestic timberland investments and an increasing number is even becoming net importers of timber – a resource, they could grow domestically. While trans-national companies are engaged in tropical forest regions in developing countries in the use of existing natural forest resources, the necessary supply with timber through increased planting is not supported. Since domestic markets continue to play the major role in timber and wood-based products, more attention should be drawn to domestic markets and processing industries rather than the supply of the world market. This is also valid for the fact that many developing countries are not in the position to compete with timber supplied by countries with a more favourable investment, infrastructural and political environment.

Markets for environmental services are evolving at an interesting speed, even though they remain local or national. The call for the "internalization of externalities" like social and environmental services (climate, biodiversity, water, recreation, tourism, landscape etc.) should therefore be addressed at the national level with the exception of the evolving carbon offset trading mechanisms like the emerging Clean Development Mechanism (CDM) of the Kyoto Protocol under the UNFCCC. The theoretic potential of those services in terms of income generation in support of sustainable practices in forests need to be further analysed and their commoditization should be based on the current practices.

Trade liberalisation has forced governments and other stakeholders in several countries with reasonably strong regulatory capabilities to focus attention on addressing some underlying problems (e.g.

inefficiency/over-capacity in industry). Even in weaker governance situations this effect can be positive - liberalisation has stimulated the rise in profile and capability of the private sector and civil society to engage on forest trade (the former in general to seize opportunities, the latter in general to protest at abuses) – although a period of sub-optimal, incoherent and mutually conflicting actions can be expected before effective negotiated improvements amongst these stakeholders emerges. However, a basic characteristic of the institutional architecture in many countries is that constituencies and government institutions who deal with forestry and those who deal with trade are not engaged. Not many forestry departments around the world are very good at managing and negotiating issues of forest trade. Similarly it is difficult to find examples of countries where debate on trade liberalisation has been the key lever to open up forest sector planning and the development of strategic ways forward like national forest programmes.

The international community, including governments, the private sector and NGOs as well as national constituencies have been called or agreed to engage in forest sector reforms in a comprehensive and coherent way as to address forest-related issues, problems and solutions in a cross-sectoral way. It is interesting to note that many countries are quite effectively undergoing such reform process through national forest programmes and alike. However, in only very few countries, trade in forest products and services and market development has been a major issue. Analysing market prospects and developments, clarifying and identifying comparative advantages in forest production in a given context is a matter of forest policy making and should therefore be subject to forest policy processes such as national forest programmes. Also, forest sector reforms, particularly in forest rich countries have often been driven by trade dynamics and trade policy changes, including competitive tendering of timber concessions, forest taxation, deregulation and decentralisation as well as privatisation. It depends on the way in which the forestry sector pro-actively interacts with changes in trade policy and trade dynamics as well as international or national political pressure whether the impacts and interaction between trade and SFM can be moved towards positive synergies.

In conclusion, this analysis has shown that the impacts and interactions between trade in forest products and services and sustainable forest management need to be continuously analysed and communicated to major stakeholders to facilitate the debate and to arrive at solutions that are based a better understanding of trade as the motor for development.

List of references

- Abare. & Pöyry, J.** 1999. *Global Outlook for Plantations*. Canberra: Australian Bureau of Agricultural and Resource Economists.
- Abelson, P.** 1996. *Project Appraisal and Valuation Methods for the Environment with Special Reference to Developing Countries*. New York: Macmillan.
- Accelerated Tariff Liberalization in the Forest Products Sector.** 1999. *A Study of the Economic and Environmental Effects*. Office of the United States Trade Representative.
- Adamowicz, W., Louviere, J. & Williams, M.** 1994. Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities. *Journal of Environmental Economics and Management* 26 (3): 271–292.
- Adamowicz, W.L., Boxall, P.C., Williams, M. & Louviere, J.** 1998. Stated Preference Approaches for Measuring Passive Use Values: Choice Experiments and Contingent Valuation. *American Journal of Agricultural Economics*, 80 (1): 64–75.
- Adams J.** 1997. *Globalisation, Trade and Environment*. Paper prepared for Workshop on Economic Globalisation and Environment, Vienna, 30-31 January 1997. Paris, France: OECD Environment Directorate.
- Ades A. & Tella, R.Di.** 1999. Rents, competition and corruption. *American Economic Review* 89 (4): 982-93.
- Ahmed. & Mahmood.** 1998. *Policy that works for forests and people*. Series No. 1: Pakistan Country Study. Changing perspectives on forest policy. IUCN – The World Conservation Union. Islamabad. Pakistan.
- Alemu, T.** 1999. *Land tenure and soil conservation: evidence from Ethiopia*. Unpublished PhD thesis, Economics Department, Goteborg University, Sweden.
- Alkire, S.** 2002 Dimensions of human development. *World Development* 30 (2): 181-205.
- Amacher, G., Hyde, W., Cruz, W. & Grebner, D.** 1998. Environmental motivations for migration: population pressure, poverty and deforestation in the Philippines. *Land Economics* 74 (1): 92-101.
- Amilien, C.** 1996. Conflicting international policies in tropical timber trade. *Environmental Conservation* 23: 29-33.
- Anderson K. & Blackhurst, R.** (eds). 1992. *The Greening of World Trade Issues*. Michigan, USA: University of Michigan Press/ Ann Arbor.
- Andersson T., Folke C. & Nyström, S.** 1995. *Trading with the Environment. Ecology, Economics, Institutions and Policy*. London: Earthscan.
- Angelsen, A. & Wunder, S.** 2003. *Exploring the Forest-Poverty Link: Key Concepts, Issues and Research Implications* Occasional Paper No.40. CIFOR. Bogor, Indonesia.
- Antle, J.** 1983. Infrastructure and aggregate agricultural productivity: international averages. *Economic Development and Cultural Change* 31 (3):609-19.
- APEC.** 1997. *The Impact of Trade Liberalization in APEC*. APEC #97-EC-01.2; APEC Secretariat. Singapore.
- APEC.** 1999. *Study of Non-Tariff Measures in the Forest Products Sector*. Prepared for Committee on Trade and Investment, Asia-Pacific Economic Cooperation. Rotoroa, New Zealand: New Zealand Forest Research Institute Limited.
- APEC.** 2001. Update of Activities. *Early Voluntary Sectoral Liberalisation (ESVL)*. Asia-Pacific Economic Cooperation.
- Araya, M.** 2001. *Trade and environment: bridging gaps and moving forward*. Proceedings of a conference organised by the Global Environment and Trade Study (GETS) and the World Trade Institute (WTI), 8-9 March 2001, Geneva, Switzerland. New Haven, USA: GETS.

- Arnold, J.E. & Dewees P.A.** 1997. *Farms, trees and farmers. Responses to agricultural intensification*. London, UK: Earthscan.
- Arnold, J.E. & Ruiz Pérez, M.** 1998. The role of Non Timber Forest Products in Conservation and Development. in: E. Wollenberg and A. Ingles *Incomes from the forest*. Bogor, Indonesia: Centre for International Forestry Research, pp. 17-42.
- Arnold, M.G., Kohlin, R., Persson & Shepherd, G.** 2003. *Fuelwood Revisited: What Has Changed in the Last Decade?* CIFOR Occasional Paper No. 39. Bogor, Indonesia: Center for International Forest Reserach.
- Astorga, L.E.** 1998. *Relaciones entre la convención de la diversidad biológica y los instrumentos globales de comercio*. Estudio de Caso sobre Chile. Draft.
- ATO/ITTO.** 2003. *ITTO Policy Development*. Series No.14 ATO/ITTO principles, criteria and indicators for the sustainable management of African natural tropical forests. Libreville, Gabon. ATTO.
- Australia Agriculture and Fisheries.** 2000. *The Intergovernmental Panel on Forests" and "The Intergovernmental Forum on Forests*. Canberra. Australia
- Auty R.** 1990. Natural Resources, the State and Development Strategy'. *Journal of International Development* 9: 651-663.
- Bacchetta, M. & Bora, B.** 2001. *Post-Uruguay Round Market Access Barriers for Industrial Products. Policy issues in international trade and commodities study series No. 12*, UNCTAD.
- Baharuddin, H.G. & Simula, M.** 1994. *Certification Schemes of All Types of Timber*. ITTO. Yokohama.
- Baharuddin, H.G. & Simula, M.** 1996. *Timber Certification in Transition*. ITTO. Yokohama.
- Baharuddin, H.G. and Simula, M.** 1998. *Timber Certification: Progress and Issues*. ITTO. Yokohama.
- Bales, K.** 2000. *New slavery*. Oxford, UK: ABC-CLIO.
- Barbier, E. B.** 1991. *The Economic Value of Ecosystems: 2 – Tropical Forests*. LEEC Gatekeeper Series No 91-01. London, UK: International Institute for Environment and Development (IIED).
- Barbier, E.B.** 1997. *The effect of the Uruguay Round tariff reductions on the forest products trade: a partial equilibrium analysis*. University of Warwick, Coventry.
- Barbier, E.B.** 1999. *Timber trade and environment*: In M.Palo and J.Uusivuori (eds.), *World Forest, Society and Environment*. The Netherlands.
- Barbier, E.B. & Burgess, J. C.** 1997. The Economics of Tropical Forest Land Use. *Land Economics* 73 (2):174–195.
- Barbier, E.B., Burgess, J., Bishop, J. & Aylward, B.** 1994. *The Economics of the Tropical Timber Trade*. London, UK: Earthscan.
- Barbier, E.B., Bockstael, Burgess. & Strand.** 1995. *The Linkage between the Trade and Tropical Deforestation*. Indonesia.
- Barbier, E.B., J.C Burgess, J.T. Bishop, B.A. Aylward & C. Bann.** 1993. *The Economic Linkages between International Trade in Tropical Timber and the Sustainable Management of Tropical Forests*. IIEC. ITTO. Yokohama.
- Bardham, P.** 1997. Corruption and Development: A Review of Issues. *Journal of Economic Literature* XXXV: 1320-1346.
- Barr, C.** 2000a. *Will HPH Reform Lead to Sustainable Forest Management? Questioning the Assumptions of the Sustainable Logging Paradigm in Indonesia*. Washington DC, USA and Bogor, Indonesia: WWF-International Macroeconomic Program Office and Center for International Forestry Research (CIFOR).

- Barr, C.** 2000b. *Profits on Paper: The Political Economy of Fiber, Finance, and Debt in Indonesia's Pulp and Paper Industries*. Washington DC, USA and Bogor, Indonesia: WWF-International Macroeconomic Program Office and Center for International Forestry Research (CIFOR).
- Barr, C.** 2001. *Banking on sustainability: structural adjustment and forestry reform in post-Suharto Indonesia*. Washington DC, USA and Bogor, Indonesia: WWF-International Macroeconomic Program Office and Center for International Forestry Research (CIFOR).
- Bass, S.** 2000. *Policy that works for forests and people*. Series No. 10: Grenada discussion paper. Participation in the Caribbean: A review of Grenada's forest policy process. . London, UK: International Institute for Environment and Development (IIED).
- Bass, S.** 2003. (in press) *International Commitments, Implementation and Cooperation*. Invited paper for XII World Forestry Congress 'Forests, Source of Life', Session 'Global thinking in action', Quebec City, September 2003.
- Bass, S., Dubois, O., Moura, P., Costa, M., Pinard, R. Tipper & Wilson, C.** 2000. *Rural livelihoods and carbon management*. London, UK: International Institute for Environment and Development (IIED).
- Bass, S., Hughes, C. & Hawthorne, W.** 2001. Forests, biodiversity and livelihoods: linking policy and practice in I. Koziell and J. Saunders *Living off biodiversity*. London, UK: International Institute for Environment and Development (IIED), pp. 23-74.
- Bass, S., Thornber, K., Markopoulos, M., Roberts, S. & Grieg-Gran, M.** 2001. *Certification's Impacts on Forests, Stakeholders and Supply Chains*. London, UK: International Institute for Environment and Development (IIED).
- Bawa, K. & Seidler, R.** 1998. Natural forest management and conservation of biodiversity in tropical forests. *Conservation Biology* 12: 46-55.
- BFH.** 2002. *Jahresbericht 2001*
- Bhagwati, J.** 2002. *Free Trade Today*. New Jersey, USA: Princeton University Press.
- Blundell, A.G. & Rodan, B.D.** 2002. *Monitoring Mahogany*. ITTO Tropical Forest Update. Vol.12, No.1.
- Boado, E.L.** 1988. Incentive policies and forest use in the Philippines, in R. Repetto and M. Gillis (eds) *Public policies and the misuse of forest resources*. Cambridge, UK: Cambridge University Press, pp.165-204.
- Bodley, J.** 1993. Indigenous peoples and development' in S. Rietbergen (ed.) *The Earthscan reader in tropical forestry*. London: Earthscan, pp. 275-280.
- Boeke, J.** 1948. *The Interests of the Voiceless Far East*. Leiden: Universitaire Pers.
- Boeke, J.** 1953. *Economics and economic policy of dual societies*. New York: Institute of Pacific Relations.
- Booth, D. & Lucas, H.** 2002. *Good practice in the development of PRSP indicators and monitoring systems*. ODI Working Paper 172. London, UK: Overseas Development Institute.
- Bora, B., Kuwahara, A. & Laird S.** 2002. *Quantification of Non-Tariff Measures. Policy issues in international trade and commodities study series No. 18*, UNCTAD.
- Bora, B., Lloyd, P.J. & Pangestu, M.,** 2000. *Industrial Policy and WTO*. Study series on policy issues in international trade and commodities No. 6, UNCTAD.
- Borregaard, N. & Dufey, A.** 2001. *Effects of Foreign Investment versus Domestic Investment on the Mining and Forestry Sectors in Latin America*, Unpublished paper prepared by CIPMA for the OECD.

- Borregaard, N., Dufey, A. & Gallagher, K.** 2003. Getting to green: overcoming obstacles to liberalizing environmental goods and services under the WTO. In Trade, Environment and Investment: Cancun and Beyond *Policy Matters* 11, September. IUCN Commission on Environmental, Economic and Social Policy.
- Bosdijk, K.** 2002. *Market requirements for certified timber and certified timber products – the European perspective*. ITTO International Workshop on Comparability and Equivalence of Forest Certification Schemes, Kuala Lumpur, Malaysia, 3-4 April 2002.
- Bourgignon, F., Coyle, D., Fernandez, R., Giavazzi, F., Marin, D., O'Rourke, K., Portes, R., Seabright, P., Venables, A., Verdier, T. & Alan Winters, L.** 2002. *Making Sense of Globalization: A Guide to the Economic Issues* CEPR Policy Paper No. 8. London, UK: Centre for Economic Policy Research.
- Bourke, I.J.** 1988. *Trade in Forest Products: A Study of the Barriers Faced by the Developing Countries*. FAO Forestry Paper No. 83. FAO, Rome.
- Bourke, I.J.** 1995. International Trade in Forest Products and the Environment. In FAO Unasylva, Vol. 46 No. 183, p. 11. October.
- Bourke, I.J.** 1999. *Trade Instruments and Their Impacts on Sustainable Forestry Development*. FAO. Rome.
- Bourke, I.J.** 2003. *Trade Restrictions and Trade Agreements Affecting International Trade in Forest Products* Report for IIED – April. London, UK: International Institute for Environment and Development (IIED).
- Boyd, R., Doroodian, K. & Abdul-Latif, S.** 1993. The effect of tariff removals on the North-American lumber trade. *Canadian Journal of Agricultural Economics*.
- Boyd, R.G. & Hyde, W. F.** 1989. *Forestry Sector Intervention: The Impacts of Public Regulation on Social Welfare*. Ames, USA: Iowa State University Press.
- Brack, D., K. Gray & Hayman, G.** 2002. *Controlling the international trade in illegally logged timber and forest products*. London, UK: Royal Institute of International Affairs. (Available at <http://www.riia.org/pdf/research/sdp/tradeinillegaltimber.pdf>).
- Brack, D., Marijnissen, C. & Ozinga, S.** 2002. *Controlling Imports of Illegal Timber: Options for Europe*. London, UK: Royal Institute of International Affairs and FERN. (Available at www.illegal-logging.info/documents/html)
- Bridges.** 2003. Cancun Ministerial Meeting. *BRIDGES Trade BioRes* 3 (15). ICTSD/IUCN/ CEESP.
- Brooks, D.J.** 1999. *Model-based analysis of the effects of the ATL on trade in forest products*. Appendix 5 in Accelerated Tariff Liberalization in the Forest Products Sector: A Study of the Economic and Environmental Effects. Office of the U.S. Representative, Washington D.C.
- Brooks, D.J., Ferrante, J.A., Haverkamp, J., Bowles, I., Lange, W. & Darr, D.,** 2001. *Economic and Environmental Effects of Accelerated Tariff Liberalization in the Forest Products Sector*. USDA, PNW GTR-517.
- Brown, C.** 1997b. *In-Depth Country Study – New Zealand*. Asia-Pacific Forestry Outlook Study, working paper No.5. FAO. Rome.
- Brown, C., Durst, P. & Enters, T.** 2002. *Forests Out of Bounds: Impacts and Effectiveness of Logging Bans in Natural Forests in Asia-Pacific*. Bangkok, Thailand: Food and Agriculture Organization of the United Nations (FAO).
- Brown, L.** 2002. *State of the World 2002*. Washington DC, USA: Worldwatch Institute.
- Buitrón, X. & Mulliken, T.** 1997. *CITES Appendix III and the Trade in Big-Leafed Mahogany*. TRAFFIC International. Cambridge.

- Bundesministerium für Ernährung, Landwirtschaft und Forsten.** 2000 *Forstwirtschaft und Biologische Vielfalt: Strategie zur Erhaltung und Nachhaltigen Nutzung der Biologischen Vielfalt in den Wäldern Deutschlands.*
- Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung.** Undated. *Umwelt, Armut und Nachhaltige Entwicklung.* BMZ. Berlin
- Buongiorno, J., Zhu, S., Zhang, D., Turner, J. and Tomberlin, D.** 2003. *The Global Forest Products Model.* Academic Press
- Burger, D. & Mayer C..** *Ernst machen mit nachhaltiger Entwicklung: die Rolle von Sozial- und Ökostandards.* GTZ. Echborn.
- Burrows, J. & Sanness, B.** 1998. *The Competitive Climate for Wood Products and Paper Packaging; The Factors Causing Substitution with Emphasis on Environmental Promotion.* Subgroup Substitution Project of Joint. FAO/ECE Team.
- Byron, N. & Arnold, M.** 1997. *What futures for the people of the tropical forests?* CIFOR working paper No. 19. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Callister, D.J.** 1992. *Illegal Tropical Timber Trade: Asia-Pacific.*
- Callister, D.J.** 1999. *Corrupt and Illegal Activities in the Forest Sector: Current understandings and implications for World Bank Forest Policy.* Draft for Discussion for the World Bank Group. Forest Policy Implementation Review and Strategy Development: Analytical Studies. Washing DC, USA: World Bank.
- Cariño, J.** 1997. Indigenous peoples, forest dwellers, women and local communities. in *Proceedings of the XI World Forestry Congress, 13-22 October 1997, Antalya, Turkey.* Vol. 5. No. 29, pp. 143-153. (Avalable <http://www.fao.org/montes/foda/wforcong/publi/v5/T29E/1.HTM>)
- Carson, R.T.** 1991. Constructed Markets in J. B. Braden and C.D. Kolstad (eds) *Measuring the Demand for Environmental Quality.* Amsterdam: North-Holland.
- Carson, R.T., Mitchell, R.C., Hanemann, W.M., Kopp, R.J., Presser, S. & Ruud, P.A.** 1994. *Contingent Valuation and Lost Passive Use: Damages from the Exxon Valdez.* Discussion Paper No 94-18. Washington DC, USA: Resources for the Future.
- Cashore, B.** 1999. US Pacific Northwest in B. Wilson, G.C. Van Kooten, I. Vertinsky, and L. Arthur (eds) *Forest Policy, International Case Studies.* Wallingford, UK and New York, USA: CABI Publishing.
- Castillo, E.** 2001 President, Castle Doors LLC, Presentation at the Sustainable Enterprise Summit Washington DC: World Resources Institute (WRI). (available at http://pdf.wri.org/2001summit_castilloppt.pdf)
- CBD.** 1998. *Work Programme for Forest Biological Diversity under the Convention on Biological Diversity.* Fourth Meeting of the Conference of Parties.
- CEDR/UNEP.** 2001. *Environmental Impacts of Trade Liberalization in the Tanzanian Forestry Sector.* Centre for Environmental Economics and Development Research/United Nations Environment Programme. (available at <http://www.unep.ch/etu/etp/events/recent/berdocs.htm>)
- CEPI.** 2000. *CEPI's Position on the WTO Trade Round.* Brusselss: Confederation of European Paper Industries.
- CEPI.** 2001. *Comparative Matrix of Forest Certification Schemes.* Confederation of European Paper Industries. Brussels
- Changjin Sun.** 2000. *WTO and Chinese Forestry: An Outline of Knowledge and Knowledge Gaps.* Beijing, China: Chinese Academy of Social Sciences.
- Chomitz, K. & Gray, D.** 1996 Roads, land use, and deforestation: a special model applied to Belize. *World Bank Economic Review* 10 (3): 487-512.

- Choon, W.K. & Ginnings M.J.** 1999. *Impediments to Market Access for Tropical Timber*. ITTO Yokohama.
- Chrystanto. & Santoso, I.** *Study on discrepancy of Forest Product Trade Statistic in Indonesia*. Yokohama. Japan. International Tropical Timber Organisation (ITTO) (available at www.itto.or.jp)
- CIEL.** 1997. *The Convention as Biological Diversity and the WTO: Legal and Policy Linkages*. IUCN, Environmental Law Centre/Global Policy Programme.
- CIFOR.** 1999. *The CIFOR criteria and indicators generic template*. The criteria and indicators toolbox series No. 2. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Cohen, D. & Sinclair, S.** 1991. Forward vertical integration for Canadian and US producers of structural panels and softwood lumber: trends of the 1980s. *Forest Products Journal* 41 (1) 46-52.
- Colchester, M.** 1993. Forest peoples and sustainability. in M. Colchester and L. Lohmann *The struggle for land and the fate of the forests*. London, UK: Zed Books, pp 61-98.
- Colin.** 2002. *Production, privatisation and preservation in Papua New Guinea Forestry*. Hunt (ed.). London, UK: International Institute for Environment and Development.
- Contreras-Hermosilla, A.** 2000. *Forest Law Enforcement*.
- Contreras-Hermosilla, A.** 2002. *Selected forest products trade issues*. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).
- Contreras A.P., Lebel, L. & Pas-ong, S.** 2001. *The Political Economy of Tropical and Boreal Forests*. IDGEC Scoping Report 3. International Dimensions of Global Environmental Change. Hanover, UL: Dartmouth College.
- Contreras-Hermosilla, A. & M. Ríos, V.** 2000. *Social, Environmental and Economic Dimensions of Forest Policy Reforms in Bolivia*. Washington DC, USA: Forest Trends.
- Cossalter, C. & Pye Smith, C.** 2003. *Fast Wood Forestry. Myths and Realities*. CIFO/IUCN/Forest Trends/WWF.
- Costa et al.** 1999. Working Draft: *Financial Mechanisms for Sustainable Forestry*. Programme on Forests. New York, USA.
- Coyle, D.** 2001. Trade. The great debate. *Developments* 15: 5-9.
- Crook, C.** 2001. Globalisation and its critics. A survey of globalisation. *The Economist*, September 29, 2001 Supplement.
- Cross (ed.) N.** 2003. *Evidence for hope: the search for sustainable development*. London. Earthscan.
- Crosson, P.** 1985. Impact of erosion on land productivity in the United States in S. el Swaify, W. Moldehauer and A. Lo (eds) *Soil Erosion and Conservation*. Ankeny, USA: Soil Conservation Society of America.
- Crosson, P. & Stout, T.** 1983. *Productivity effects of cropland erosion in the United States*. Unpublished mss. Washington DC, USA: Resources for the Future.
- Cruz, W., Francisco, H. & Conroy, Z.** 1988. The onsite and downstream costs of soil erosion in the Magat and Pantabangan watersheds. *Journal of Philippine Development* 15 (1): 48-85.
- CTE.** 2003. *Report to the 5th Session of the WTO Ministerial Conference in Cancún*. Geneva: World Trade Organization Committee on Trade and Environment.
- Cummings, R.G., Brookshire, D.S. & Schultze, W.D.** 1986. *Valuing Environmental Goods: A State of the Art Assessment of the Contingent Valuation Method*. Totowa, USA: Rowman & Allenheld.

- Czaplewski, R.L.** 2002. *On Sampling for Estimating Global Tropical Deforestation*. Forest Resources Assessment Programme Working Paper 60. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).
- Damiana, R., Fredriksson, P. & List, J.** 2000. *Trade Liberalization, Corruption and Environment Policy Formation: Theory and Evidence*. Discussion Paper 0047, Centre for International Economic Studies. Adelaide, Australia: Adelaide University.
- Danzer Group.** 2002. Press Release: Danzer restructures its European business (available at www.danzer.de)
- Dauvergne, P.** 1997. *Shadows in the Forest. Japan and the Politics of Timber in Southeast Asia*. Cambridge, USA: MIT Press.
- Dawkins, H.C. & Philip, M.S.** 1998. *Tropical moist forest silviculture and management. A history of success and failure*. Wallingford, UK: CAB International.
- de Soto, H.** 2000. *The Mystery of Capital*. London, UK: Black Swan.
- Deacon R.T.** 1994. *Deforestation and the Rule of Law in a Cross-Section of Countries*. Resources for the Future Discussion Paper 94-23. Washington, DC: Resources for the Future.
- Desclos, P.** 2000. *Timber and Forest Discussion Papers: Markets for Secondary Processed Wood Products, 1999-2000*. Geneva. United Nations Economic Commission for Europe - FAO
- DFID.** 1999. *Shaping forest management. How coalitions manage forests*. London, UK: Department for International Development (DFID).
- Dobson, P., Waterson, M. & Chu, A.** *The Welfare Consequences of the Exercise of Buyer Power*, Research paper 16, September, Office of Fair Trading, London.
- Down to Earth.** 2001. Forests - Debt, poverty, greed fuel destruction. *Down to Earth Newsletter* No. 49. May 2001.
- Downes, D.R. & Van Dyke, B.** 1998. *Fisheries Conservation and Trade Rules: Ensuring That Trade Law Promotes Sustainable Fisheries*. CIEL, Greenpeace.
- Downes, D.R.** 1998. *Toward Sustainable Trade: Integrating Implementation of the Convention on Biological Diversity and the Rules of the World Trade Organization*. Bonn. IUCN Environmental Law Centre. Discussion Draft.
- Dudley N., Jeanrenaud, J -P. & Sullivan, F.** 1995. *Bad Harvest? The Timber Trade And The Degradation Of The World's Forests*. London, UK: Earthscan.
- Dudley, N. & Nectoux, F.** 1995. *The Timber Trade. A Study for the Expert Panel on Trade and Sustainable Development*. Equilibrium.
- Dudley, N.** 1992. *Forests in Trouble: A Review of the Status of Temperate Forests World-wide*. WWF. London.
- Dudley, N.** 2002. *A manual on forest quality*. First Draft. Bristol, UK: WWF, IUCN, EPFL and GTZ.
- Dudley, N., Gilmour, D. & Jeanrenaud, J-P.** 1996. *Forests for life*. Gland, Switzerland: World Conservation Union.
- Dudley, N., Stolton, S. & Pur, R.** 2003. *The importance of forest protected areas to drinking water.Alliance..* World Bank / WWF Alliance for Forest Conservation and Sustainable Use. Gland, Switzerland and New York, USA.
- Dui, G.** 2003c. *Study on Discrepancies in Forest Products Trade Statistics - China Case*. Yokohama. Japan. International Tropical Timber Organisation (ITTO) (available at www.itto.or.jp)
- Durst, P., Waggener T., Enters T. & Lay Cheng T.** 2001. *Forests Out of Bounds: Impacts and Effectiveness of Logging Bans in Natural Forests in Asia-Pacific*. RAP Publication 2001/08 Asia- Pacific Forestry Commission. Bangkok, Thailand: Food and Agriculture Organization of the United Nations (FAO).

- Dutfield, G.** 1999. *Background Paper on Intellectual Property Rights and Plant Genetic Resources with Particular Reference to Seeds and Plant Varieties*. IUCN Project on the Convention on Biological Diversity and the International Trade Regime. St Peter's College & Oxford Centre for the Environment, Ethics and Society. Oxford. Draft.
- Dykstra, D.P.** 2001. The old and the new of reduced impact logging. *Tropical forest update*. 11 (2): 3-4.
- Easton, I. & Perez-Garcia, J.** 2002. *Discrepancies in Forest Product Trade Statistics*. Yokohama, Japan: International Tropical Timber Organization (ITTO).
- Eba'a Atyi, R., Nussbaum, R. & Simula, M.** 2002. Interim Report on the Potential Role of Phased Approaches to Certification in Tropical Timber Producer Countries as a Tool to Promote Sustainable Forest Management ITTO – Report for the thirty-third session.
- Eba'Atyi, R. & Simula, M.** 2002. *Forest certification: pending challenges for tropical timber* ITTO Technical Series No 19. Yokohama, Japan: International Tropical Timber Organization (ITTO).
- ECE/FAO.** 2001. *Forest Products Annual Market Review 2000-2001*. United Nations Economic Commission for Europe (UNECE)/Food and Agriculture Organization of the United Nations (FAO). (available at <http://www.unece.org/trade/timber/docs/rev-01/rev01.htm>)
- Economist.** 2002. Farm Policy: Scandalous. *The Economist* 365 (8293): 13, 5 October.
- Economist.** 2003. The softwood-lumber dispute. A simple lesson in economics. *The Economist* 1 February 2003, p.49.
- Edwards, C.** 1985. *The Fragmented World. Competing Perspectives on Trade, Money and Crisis*. London, UK: Methuen & Co.
- EFI/IUCN/CIFOR.** 1996. *Options for Strengthening the International Legal Regime for Forests*. A Background Report Prepared for the European Commission.
- EIA.** 1996. *Corporate power, corruption and the destruction of the world's forests*. Environmental Investigation Agency. London: Earthscan. (Also available at www.eia-international.org/Campaigns/Forests/Regulation/transnat.html)
- EIA.** 1998. Briefing on the Illegal Trade in Forest Products. Easton, I. and Perez-Garcia, J., 2002. *Discrepancies in Forest Product Trade Statistics*. Yokohama, Japan: International Tropical Timber Organization (ITTO).
- EIA.** 2001. *Timber trafficking. Illegal logging in Indonesia, South East Asia and international consumption of illegally sourced timber*. Environmental Investigation Agency and Telepak Indonesia. London, UK: Emerson Press.
- EIA.** 2002. *The impact of the timber industry on the environment*. London, UK: Environmental Investigation Agency.
- Ekoko, F.** 1999. *Environmental Adjustment in Cameroon: Challenges and Opportunities for Policy Reform in the Forestry Sector*. Presented at workshop on Environmental Adjustment: Opportunities for Progressive Policy Reform in the Forest Sector? in F. Seymour and N. Dubash (eds) (2000)
- Ekstrom, H.** 2003. Raw material consumption on the rise despite weak global economy and local oversupply: wood raw material markets, 2002-2004. In UNECE/FAO *Forest products annual market analysis, 2002-2004*. Rome, Italy: UNECE/FAO.
- Elliott, C.** 2000. *Forest Certification: A Policy Perspective*. Jakarta, Indonesia. CIFOR, FNSNF, EPFI, WWF.
- Elliott, D.P.** 1998. *Preferential Treatment of "Green" Products and the Position of Developing Countries*. International Workshop on Market Based Instruments and

- International Trade. Institute of Environmental Studies. Amsterdam, 19-20 March 1998.
- Emrich et al.** 2000a *Annexes to the above report* (86a). Eschborn, Germany. GTZ
- Emrich et al.** 2000b *Tropical Forest Research: The Significance of Secondary Forest Management for Development Policy*. Eschborn, Germany. GTZ
- ERM.** 2002. Consultation Paper: *Procurement of Timber Products from Legal and Sustainable Sources by Government and its executing agencies*. ERM
- Esty, D.C.** 2002 Bridging the Trade-Environment Divide in K.P. Gallagher and J. Werksman (eds) *The Earthscan Reader on International Trade and Sustainable Development*. London, UK: Earthscan.
- EU.** 2002. *The EU and Forest Law Enforcement, Governance & Trade Workshop*, Brussels, 22-24 April 2002.(available at http://europa.eu.int/comm/external_relations/flegt/workshop/index.htm)
- European Commission.** 2002. *Market Access for Non-Agricultural Products*. Ref. 482/02 Rev 3. Brussels, 30 October.
- Evans, J.** 1999. *Sustainability of forest plantations. The evidence*. DFID issues paper. London, UK: Department for International Development (DFID).
- Ewing, K.P. & Tarasofsky, R.G.** 1997. *The "Trade & Environment" Agenda: Survey of Major Issues and Proposals - From Marrakesh to Singapore*. IUCN. Gland and Cambridge.
- FAO.** 1982. *Tropical Forest Resources*. FAO Forestry Paper no.30. Rome
- FAO.** 1993. *Cosecha de hongos en la región de Chile*.
- FAO.** 1995a. *Impacto ambiental de las practicas de cosecha forestal y construcción de caminos en bosques nativos siempreverdes de la X Región de Chile*
- FAO.** 1995b. *Trade restrictions affecting international trade in non-wood forest products*, by Iqbal, M. FAO Non-Wood Forest Products 8. Rome.
- FAO.** 1995c. *Uso de bueyes en operaciones de aprovechamiento forestal en áreas rurales de Costa Rica*. Rome.
- FAO.** 1996a. *Impact of the Uruguay Round on International Trade in Forest Products*, by Edward B., Barbier. Rome.
- FAO.** 1996b. *Model code of forest harvesting practice*. Rome.
- FAO.** 1996c. *Impact of the Uruguay Round on International Trade in Forest Products*. Journal of Forest Economics vol. 8, by Barbier, E. B. Rome Italy
- FAO.** 1997a. *State of the World's Forests*. Rome.
- FAO.** 1997b. *State of the World's Forests, 1997*. Rome.
- FAO.** 1997c. *FAO provisional outlook for global forest products consumption, production and trade to 2010*. Rome.
- FAO.** 1998. *Trade Restrictions and their Impact on International Trade in Forest Products*, by Bourke. & Leitch. Rome
- FAO.** 1999a. *Trade and SARD: Concepts, Issues And Tools*. Background paper prepared for the FAO/Netherlands Conference on the Multifunctional Character of Agriculture and Land, Maastricht, Netherlands, September 12-17.
- FAO.** 1999b. *Environmentally sound forest infrastructure development and harvesting in Bhutan*, by Winkler, N. Rome.
- FAO.** 1999c. *Preparing for the Forthcoming Round of Multilateral Trade Negotiations on Agriculture: A Training Kit (A)*. Rome
- FAO.** 1999d. *Preparing for the Forthcoming Round of Multilateral Trade Negotiations on Agriculture: A Training Kit (B)*. Rome.
- FAO.** 1999e. *State of the World's Forests*. Rome.
- FAO.** 1999f. *The Strategic Framework for FAO 2000-2015*. Rome.

- FAO.** 1999g. *Pluralism and sustainable forestry and rural development*. Proceedings of the International Workshop on Pluralism and Sustainable Forestry and Rural Development, Rome, 9-12 December 1997. Rome.
- FAO.** 2000a. *African Economic Integration and Food Security: Opportunities and Challenges for Economic Integration in Food, Agriculture, Fisheries and Forestry* Draft paper. FAO, Rome
- FAO.** 2000b. *Agriculture, Trade and Food Security: Issues and Options in the WTO Negotiations From the Perspective of Developing Countries*, Report and papers of an FAO Symposium held at Geneva on 23-24 September 1999. Rome.
- FAO.** 2000c. *Multilateral trade negotiations on agriculture. A resource manual*. Rome.
- FAO.** 2000d. *FAO Strategic Plan for Forestry*. Rome.
- FAO.** 2000e. *Trade restrictions and their impact on international trade in forest products*, by Bourke, I.J. & Leitch, J. Rome.
- FAO.** 2001a. *Criteria and Indicators of Sustainable Forest Management of All Types of Forests and Implications for Certification and Trade*. Secretariat Note for Committee on Forestry.
- FAO.** 2001b. *Global forest resources assessment 2000, Main report*. FAO forestry paper 140. Rome.
- FAO.** 2001c. *Forest law compliance. An overview*, by Contreras-Hermosilla, A. Rome.
- FAO.** 2001d. *State of the World's Forests, 2001*. Rome.
- FAO.** 2001e. *How forests can reduce poverty*. Rome.
- FAO.** 2001f. *Markets for High-Value Tropical Hardwoods in Europe*. Forestry Department. Rome.
- FAO.** 2001g. *Product certification and ecolabelling for fisheries sustainability*, by Roheim, C., Kevern, W., Cochrane, C., Deere, P.W. and Willmann, R.. FAO Technical Paper 422. Rome
- FAO.** 2001h. *State of the World's Forests*. Rome.
- FAO.** 2001i. *Comparison of forest area and forest area change estimates derived from FRA 1990 and FRA 2000*. Forestry Department, FAO, Working Paper no. 59. Rome.
- FAO.** 2002a. *Environmentally sound forest harvesting in Brazil in Assessment of regeneration and environmental impacts four years after harvesting*, by Stefan Wellhöfer. Rome.
- FAO.** 2002b. *Proceedings: Second Expert Meeting on Harmonizing Forest-Related Definitions for use by various stakeholders*. Forestry Division. Rome.
- FAO.** 2002c. *Papers on selected issues relating to the WTO negotiations on agriculture*. Commodities and Trade Division FAO.
- FAO.** 2002d. *The role of agriculture in the development of LDCs and their integration into the world economy*, by Dennis P. Dykstra Rudolf Heinrich 1996 *Model Code of Forest Harvesting Practice*. Commodities and Trade Division FAO. Rome.
- FAO.** 2002e. *2004-09 Medium Term Plan*. Rome.
- FAO.** 2002f. *Proceedings: Reforming Government Policies and the Fight against Forest Crime*. Rome.
- FAO.** 2002g. *The International Treaty on plant genetic resources for food and agriculture*. Rome.
- FAO.** 2002h. *Literature review on Climate Change Policies and Trade in Forest Products*, by Leitch, J. Prepared for FAO. Rome.
- FAO.** 2002i. *Forest Certification and Forest Law Compliance: Some Background*. Prepared for FAO Expert Meeting on Policy Options for Improving Forest Law Compliance, by Bourke I.J. Rome, 14-16 January 2002. Forest Products Division. Rome.

- FAO.** 2002j. *Countries of Tropical Asia: An Overview*. Non-Wood Forest Products No. 15, by Vantomme, P., Markkula & Leslie (ed.). Rome.
- FAO.** 2003a. *Cross-sectoral policy impacts between forestry and other sectors*, by Dube, Y.C., & Schmithüsen. Rome.
- FAO.** 2003b. The future of criteria and indicators for sustainable forest management. *Unasylva* 212. Vol.54, 2003/1. FAO Rome
- FAO.** 2003c. Available at <http://www.fao.org/biotech/sector5.asp?lang=en>. Food and Agriculture Organization, Rome.
- FAO.** 2003d. *Expert Consultation on Trade and Sustainable Forest Management - Impacts and Interactions*. Forest Products Division. Rome.
- FAO.** 2003e. *Directory of Initiatives promoting sustainable forest management*. FAO Advisory Committee on Paper and Wood Products, Mexico 2003 Item 4. Rome.
- FAO.** 2003f. *Forests and Climate Change: Reader on Modalities for including afforestation and reforestation project activities under the Clean Development Mechanism*. Forestry Department. Rome.
- FAO.** 2003g. *Regional report - opportunities and challenges towards*, European Commission ,African Development Bank 2003 Forestry Outlook Study for Africa. 2020. Rome.
- FAO.** 2003h. *State of the World's Forests*. Rome.
- FAO.** 2003i. Proceeding: *FAO Advisory Committee on paper and wood products*, Forty-fourth session Oaxaca, Mexico 8-9 May 2003. Rome.
- FAO.** 2003j. *WTO Agreement on Agriculture. The implementation experience".Developing country case studies*. Rome.
- FAO.** 2003k. *Forests and Forestry: FAO and its Work*. Rome.
- FAO.** 2003l. *State of the World's Forests 2003*. Rome.
- FAO.** Undated. Making, Programmes and Projects Status, Policies and Legislation: Tanzania, Malaysia, Chile. (available at www.fao.org/forestry/)
- FAO/AUSTRIA.** 1999. Proceedings: *FAO/AUSTRIA Expert Meeting on environmentally sound forest operations for countries in transition to market economies*.
- FAO/ECE/ILO.** 2003. *Harvesting of non-wood forest products*. Committee on forest technology, management and training.
- FAO/IUFRO.** 1997. Proceedings: *Research on environmentally sound forest practices to sustain tropical forests*.
- FAO/IUFRO/ILO.** 2003. *New trends in wood harvesting with cable systems for sustainable forest management in the mountains*.
- Feder, G., Onchan, T., Chalamwong, Y. & Hongladarom, C.** 1988. *Land Ownership Security, Farm Productivity, and Land Policies in Thailand*. Baltimore, USA: Johns Hopkins University Press.
- FERN.** 2003. EU Forest Watch, Issue 70. (available at www.fern.org). Brussels
- FIELD.** 1998. *The Conservation and Sustainable Use of Forest Biological Diversity: The Role of the Convention on Biological Diversity*. Working Draft for Discussion. London.
- Filer, C. & Sekhran, N.** 1998. *Loggers, donors and resource owners. Policy that works for forests and people - Papua New Guinea*. London, UK: International Institute for Environment and Development (IIED)/Port Moresby, Papua New Guinea: National Research Institute.
- Forest Research.** 1999. *Study of Non-Tariff Measures in the Forest Products Sector*. Prepared for APEC.

- Forest Stewardship Council.** 2002a. *2001 Annual Report*. Oaxaca, Mexico: Forest Stewardship Council (FSC). (available at www.fscoax.org)
- Forest Stewardship Council.** 2002b. *The SLIMFs Initiative: A Progress Report. Increasing Access to FSC Certification for Small and Low Intensity Managed Forests*. Oaxaca, Mexico: Forest Stewardship Council (FSC). (available at www.fscoax.org)
- Forests Monitor.** 1998. *High stakes - the need to control transnational logging companies: a Malaysian case study*. Cambridge, UK: Cambridge University Press.
- Forests Monitor.** 2002. *The Wild West: Trees in Transit. The timber trade between Siberia, the Russia Far East and China*. (available at www.forestsmonitor.org/reports/russia/twecov2.htm)
- Fredriksson, P.** (ed). 1999. *Trade, Global Policy, and the Environment*. World Bank Discussion Paper 402. Washington, DC, USA: World Bank.
- Freeman, A. M. III.** 1993. *The Measurement of Environmental and Resource Values: Theory and Methods*. Washington DC, USA: Resources for the Future.
- Fridtjof Nansen Institute.** 2003. *Yearbook of International Co-operation on Environment and Development 2002/2003*. London, UK. Earthscan.
- Frost, B., Mayers, J. & Roberts, S.** 2003. *Growing credibility: impact of certification on forests and people in South Africa*. London, UK: International Institute for Environment and Development (IIED).
- FSC.** 2002. Data on certification accurate as of 31 July 2002. Oaxaca, Mexico: Forest Stewardship Council (FSC). (available at www.fscoax.org)
- Furnival, J.** 1939. *Netherlands India: A Study of Rural Economy*. Cambridge, UK: Cambridge University Press.
- Furnival, J.** 1948. *Colonial Policy and Practice: A Comparative Study of Burma and Netherlands India*. Cambridge, UK: Cambridge University Press.
- Gardner-Outlaw, T & Engelman, R.** 2001. *Forest Futures: Population, Consumption and Wood Resources*. Washington DC: Population Action International.
- Garforth, M. & Thornber, K.** 2002. *Impacts of certification on UK forests*. A report for the UKWAS Support Unit, Forestry Commission UK.
- Garforth, M., Landell-Mills, N. & J. Mayers.** 2002. *Changing ownership and management of state forest plantations: draft overview*. Prepared for the International Conference on Changing Ownership and Management of State Forest Plantations: Issues, Approaches and Implications, Cape Town, South Africa, 6-8 November 2002. London, UK: International Institute for Environment and Development (IIED).
- Geist, H.J. & Lambin E.F.** 2001. *What drives tropical deforestation?* Lucc Report Series No. 4., Louvain-la-Neuve, Belgium: University of Louvain.
- GFC.** 2000. *Report of a diagnostic study of social issues in sustainable forest management*. Georgetown, Guyana: Guyana Forestry Commission.
- Ginsberg, N.** 1973. From colonialism to national development: geographical perspectives on patterns and policies. *Annals of the Association of Geographers* 63 (1): 1-21.
- Gitay, H., Suarez, A., Dokken, D.J., & Watson, R.T.** 2002. *Climate Change and Biodiversity*. IPCC.
- Glastra, R.** 1998. *Cut and run. Illegal Logging and Timber Trade in the Tropics*. Ottawa, Canada: International Development Research Centre (IDRC).
- Global Forest Watch.** 2000a. *An overview of logging in Cameroon*. Washington DC, USA: World Resources Institute.
- Global Forest Watch.** 2000b. *A first look at logging in Gabon*. Washington DC, USA: World Resources Institute.

- Global Witness.** 2001a. *The credibility gap and the need to bridge it*. London, UK: Global Witness.
- Global Witness.** 2001b. *Taylor-made. The Pivotal Role of Liberia's Forests and Flag of Convenience in Regional Conflict*. London, UK: Global Witness in conjunction with the International Transport Workers Federation (ITF). London.
- Glowka, L., Burhenne-Guilmin, F., Syngé, H., McNeely, J.A. & Gündling, L.** 1994. *A Guide to the Convention on Biological Diversity*. IUCN. Gland and Cambridge.
- Goetzl, A.** 2003. *Discrepancies in Foreign Trade Data. An assessment of U.S. and ITTO Trade Statistics on Tropical Wood Trade*. Seneca Creek Associates, LLC. Jakarta, Indonesia. International Tropic Timber Organization (ITTO).
- Göhler D.** 2003. *Livelihood Strategien unter besonderer Berücksichtigung der Waldressourcen*. GTZ. Echborn.
- Government of Indonesia, Ministry of Forestry and Estate Crops.** 1997. *Statistical estate crops of Indonesia, 1996-98*. Jakarta, Indonesia: DG of Estate Crops.
- Grainger, A.** 1993. *Controlling tropical deforestation*. London, UK: Earthscan.
- Gray, J.A.** 2002. *Forest Concession Policies and Revenue System*. WORLD BANK Technical Paper No. 522, Forests Series. Washington D.C. USA
- Greenpeace.** 2001a. *Partners in mahogany crime. Amazon at the mercy of gentlemen's agreements*. Amsterdam, The Netherlands: Greenpeace International.
- Greenpeace.** 2001b. *Trading Away the Last Ancient Forests: The threats to forests from the trade liberalisation under the WTO*. Hamburg, Germany
- GTZ.** 1997. *Resultados do levantamento das reais necessidades do setor florestal madeireiro, quanto a demanda regional de treinamento e assistencia tecnica*. Santarem, Brazil: GTZ.
- Guerrero M.T., de Villa, F., Kelly, M., Reed, C. & Vegter, B.** 2000. *The Forest Industry in the State of Chihuahua: Economic, Ecological and Social Impacts Post-NAFTA*. Paper presented at the Commission for Environmental Cooperation's NAFTA Environmental Effects Symposium, Washington, D.C. Chihuahua, Mexico: Comisión de Solidaridad y Defensa de los Derechos Humanos/ Austin, USA: Texas Centre for Policy Studies.
- Gutman, P.** 2001. *Forest Conservation and the Rural Poor: A call to broaden the conservation Agenda*. WWF Macroeconomic Program Office. Washington, USA.
- Halle M., Switzer, J. & Winkler, S.** 2002. *Trade, Aid and Security: Elements of a Positive Paradigm*. Washington DC, USA: Institute for Sustainable Development and the World Conservation Union (IUCN).
- Hanley, N. & Spash, C.** 1994. *Cost-Benefit Analysis and the Environment*. Cheltenham, UK: Edward Elgar.
- Hansen, E., & Juslin, H.** 1999. *The status of forest certification in the ECE region*. Geneva timber and forest discussion papers ECE/TIM/DP/14. Geneva, Switzerland: UNECE.
- Hansen, M.** 2002. Environmental Regulation of Transnational Corporations. Needs and Prospects, in P. Utting (ed.) *The Greening of Business in Developing Countries. Rhetoric, Reality and Prospects*. London, UK: Zed Books, pp.159-18.
- Harris-White B. & White G.G.** 1996. Corruption, Liberalization and Democracy: Editorial Introduction. *IDS Bulletin* 27 (2): 1-5.
- Hauselmann, P.** 1996. *ISO Inside Out. ISO and Environmental Management*. WWF International Discussion Paper.
- Hearne, R. R.** 1996. Economic Appraisal of Use and Non-Use Values of Environmental Goods and Services in Developing Countries. *Project Appraisal* 11 (4): 255-260.

- Heindrichs, T.** 1997. *Innovative financing instruments in the forestry and nature conservation sector of Costa Rica*. GTZ. Eschborn.
- Hellman, J., Jones, G. & Kaufmann, D.** 2002. *Far From Home: Do Foreign Investors Import Higher Standards of Governance in Transition Economies?* World Bank Institute draft for discussion and comments. Washington DC, USA: World Bank. (available at www.worldbank.org/wbi/governance)
- Hertel, T.W.** (ed.), 1997. *Global Trade Analysis, Modeling and Applications*. Global Trade Analysis Project. Cambridge University Press.
- Heydir, L.** 1999. Population-environment dynamics in Lahat: deforestation in a regency of South Sumatra province, Indonesia in B. Baudot and W. Moomaw (eds) *People and Their Planet*. New York, USA: St. Martin's Press, pp. 91-107.
- Hirakuri, S.R.** 2003b. *Forest Law Enforcement Governance and Trade Can Law Save the Forests?* CIFOR. Jarkarta, Indonesia.
- Hoekman, B.M. & Kostecki M.M.** 2001. *The Political Economy of the World Trading System: The WTO and Beyond*. Oxford; New York, Oxford University Press.
- Hueth, D.L.** 1995. *The Use of Subsidies to Achieve Efficient Resource Allocation in Upland Watersheds*. Working Paper ENVI. IDB. Washington, D.C.
- Hufschmidt, M. M., James, D. E., Meister, A.D., Bower, B. F. & J. Dixon, A.** 1983. *Environment, Natural Systems and Development: an Economic Valuation Guide*. Baltimore, USA: Johns Hopkins University Press.
- Humphreys, D.** 1996. *Forest politics. The evolution of international cooperation*. London, UK: Earthscan.
- Hyde, W & Newman, D.H.** 1991. *Forest Economics and Policy Analysis*. World Bank Discussion Papers. Washington DC, USA: World Bank.
- Hyde, W. & Seve, J.** 1993. The economic role of wood products in tropical deforestation: the severe experience of Malawi. *Forest Ecology and Management* 57 (2): 283-300.
- Hyde, W.** 1991. The marginal costs of endangered species management: the case of the red-cockaded woodpecker. *Journal of Agricultural Economics Research* 41 (2):12-19.
- Hyde, W.** (forthcoming). *The Global Economics of Forestry*. Draft available from the author.
- ICTSD.** 2002. *Bridges Between Trade and Sustainable Development*. Nov/Dec-02. (available at www.ictsd.org)
- ICTSD/IISD.** 2003a. *Trade and Environment Doha Round Briefing Series Cancun Update Vol 2. No. 9 of 13 August*. International Centre for Trade and Sustainable Development and the International Institute for Sustainable Development.
- ICTSD/IISD.** 2003b. *Market Access for Non-Agricultural Products Doha Round Briefing Series Cancun Update Vol 2. No. 9 of 13 August*. International Centre for Trade and Sustainable Development and the International Institute for Sustainable Development.
- IFC.** 2000. *Review of 1991 Forest Strategy Annex 8*. Washington DC: International Finance Corporation. (available at www.ifc.org)
- IFC.** 2002. *Annual Report Sustainability Review IFC's Economic, Social and Environmental Impact*. Washington DC: International Finance Corporation.
- IFF.** 1998. *Trade and Environment. Background Document*. Intergovernmental Forum on Forests Category II.B.
- IFPD.** Undated. *Policy Dialogue from the Internet*.(available at www.profor.info/pages/country/)

- IIED.** 1996. *Towards a Sustainable Paper Cycle* Geneva: World Business Council for Sustainable Development/London, UK: International Institute for Environment and Development.
- IIED.** 2002a. *Laying the foundations for clean development: preparing the land use sector. A quick guide to the Clean Development Mechanism.* (available at cdmcapacity.org). London, UK: International Institute for Environment and Development.
- IIED.** 2002b. *Words into Action: For the UN World Summit on Sustainable Development, Johannesburg, 26 August - 4 September 2002.*
- IIED.** 2003a. <http://www.iied.org/forestry/>. London, UK: International Institute for Environment and Development (IIED).
- IIED.** 2003b. *Publications Catalogue 2002-03.* London, UK: International Institute for Environment and Development.
- ILO.** 1992. *Social and Labour Issues in the Pulp and Paper Industry.* International Labour Organisation, Sectoral Activities Programme, Tripartite Meeting, Geneva, 1992.
- ILO.** 2001. *Social and labour dimensions of the forest and wood industries on the move.* International Labour Organization, Sectoral Activities Programme report TMFW1/2001. Geneva, Switzerland: International Labour Organization (ILO).
- IMF.** 2003. *World economic outlook – April 2003.* Washington D.C., USA: International Monetary Fund (IMF).
- Indigenous Peoples' Caucus.** 1999. *Indigenous peoples Seattle Declaration.* Proceedings of a WTO meeting in Seattle, Washington, 29 November – 3 December 1999. (available at <http://www.ienearth.org/>)
- Indufor.** 1997. *Trade Development Strategy for the ACP Timber and Timber Product Sector.* Report prepared for European Commission DG VIII/A/I. Helsinki.
- Institute on Governance.** 2003. <http://www.iog.ca/>. Canada: Institute on Governance.
- International Energy Agency.** 1998. *Energy statistics and balances of non-OECD countries, 1995-6.* Paris, France: International Energy Agency (IEA).
- International Geosphere-Biosphere Programme.** (IGBP). 1998. IGBP Data and Information System. IGBP-DIS Global 1-km Land Cover Set DISCover. Stockholm, Sweden: International Geosphere-Biosphere Programme (IGBP).
- International Paper.** 2002a. *Facts about International Paper.* (available at www.internationalpaper.com)
- International Paper.** 2002b. *A Short History of International Paper.* (available at www.internationalpaper.com)
- IPF.** 1997. Report of the Ad Hoc Intergovernmental Panel on Forests on its Fourth Session. E/CN.17/1997/12.
- IPF/IFF.** 2003. *Implementing the Proposals for Action of the Intergovernmental Panel on Forests and the Intergovernmental Forum on Forests.* Department of Agriculture, Fisheries and Forestry – Australia (AFFA), PROFOR at the World Bank.
- Iremonger, S., Ravilious, C. & Quinton, T.** 1997. *Statistical Analysis of Global Forest Conservation. A Global Overview of Forest Conservation.* Cambridge, UK: United Nations Environment Programme-World conservation Monitoring Centre (UNEP-WCMC).
- Irwin, D.A.** 2002. *Free Trade under Fire.* New Jersey, USA: Princeton University Press.
- Isham J., Pritchett, L., Woolcock, M. & Busby, G.** 2002. *The Varieties of Rentier Experience: How Natural Resource Endowments Affect the Political Economy of Economic Growth.* Mimeo. Washington DC, USA: World Bank.

- ISO.** 1998. *Information to Assist Forestry Organization in the Use of ISO 14001 and ISO 14004*. Final draft.
- ITC.** 1998. Secondary Processed Wood Products. *An Overview of Major Markets 1996-1997*. ITC/UNCTAD/WTO. Geneva.
- ITTO.** 1992. *Guidelines for the Sustainable Management of Tropical Forests*; Yokohama.
- ITTO.** 1998. *Criteria and Indicators for Sustainable Forest Management*. Yokohama.
- ITTO.** 2002a. *International Seminar on Comparability and Equivalence of Certification Schemes*. Yokohama.
- ITTO.** 2002b. *Annual Review and Assessment of the World Timber Situation*. Yokohama, Japan: International Tropical Timber Organisation (ITTO).
- ITTO.** 2002c. *Annual Review and Assessment of the World Timber Situation*. Yokohama. Japan. International Tropical Timber Organisation. (available at www.itto.or.jp)
- ITTO.** 2002d. Ecuador's New Approach to Enforcing Forest Law in *ITTO Tropical Forest Update* 12 (1). Yokohama, Japan: International Timber Trade Organization, p21.
- ITTO.** 2002e. Cameroon Government Acts Against Illegal Loggers in *ITTO Tropical Forest Update* 12 (1). Yokohama, Japan: International Timber Trade Organization, p.28.
- ITTO.** 2003. *Review of the Indian Timber Market*. (available at www.itto.or.jp)
- ITTO.** *The Global Problem of Illegal Logging*. ITTO Newsletter, (Brazil, Indonesia, Cameroon).
- IUCN.** 1996. The Convention on Biological Diversity and the International Trade Regime. A Proposal Prepared by IUCN-the World Conservation Union, Global Policy and Partnership Division and IUCN-Environment Law Centre.
- IUCN.** 1998. Convention on Biological Diversity – *Gains and Losses in Bratislava*. *Arborvitae* 9. The IUCN/WWF Forest Conservation Newsletter.
- Johnstone, N.** 1996a. *International Trade and Environmental Change: Evidence and Implications for Developing Countries*. EEP Gatekeeper 96-01. London, UK: International Institute for Environment and Development.
- Johnstone, N.** 1996b. *The Structural Characteristics of the Pulp and Paper Sector: Economic and Environmental Implications Towards a Sustainable Paper Cycle*, Sub-study series No.18.
- Journal of Forest Economics.** 2002. *Journal of Forest Economics, Volume 8*. Urban & Fischer Verlag. Umeå, Sweden.
- Kaimowitz, D. & Angelsen, A.** 1998. *Economic Models of Tropical Deforestation: A Review*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Kaimowitz, D.** 2002. *Not by bread alone... Forests and rural livelihoods in Sub-Saharan Africa*. Paper presented to the workshop on Forests in Poverty Reduction Strategies: Capturing the Potential. October 2002, Tuusula, Finland.
- Kangas, K.** 2001. *Trade liberalisation, changing forest management and roundwood trade in Europe*. Rome: Fondazione Eni Enrico Mattei (FEEM).
- Kanowski, P.** 2001. Forestry education in a changing landscape. *The international forestry review* 3 (3): 175-183.
- Kaplinsky, R. & Readman, J.** 2002. *Globalisation and upgrading: what can (and cannot) be learnt from international trade statistics in the wood furniture sector?* Brighton, UK: Institute of Development Studies (IDS).

- Karsenty, A.** 2000. *Economic instruments for tropical forests. The Congo Basin case.* Instruments for private sector forestry series. London, UK: International Institute for Environment and Development (IIED).
- Katila, M. & Puustjarvi, E.** 2003. *Impact of New Markets for Environmental Services on Forest Products Trade.* E. International Wood Trade Publications 2002 Forest Products Export directory, 27th Edition. INDUFOR – FAO Helsinki. Finland
- Katila, P.** 2002. *Expanding Trade and Deforestation. Qualitative Comparative Analysis of the Underlying Causes of Deforestation in Selected Developing Countries (Draft).* Helsinki, Finland: METLA.
- Kaufmann, D. & Kraay A.** 2002. Growth without Governance. World Bank Institute working paper. Washington DC: World Bank. (available at www.worldbank.org/wbi/governance/wp-statecapture.htm)
- Keipi, K.** 1999. *Forest Resource Policy in Latin America.* Washington DC, USA: Inter-American Development Bank.
- Keong, C.H. & Perumal, B.** 2002. In Harmony with CITES? In *An analysis of the compatibility between current forestry management provisions and the effective implementation of CITES listing for timber species in Malaysia.* TRAFFIC Southeast Asia, Petaling Jaya, Selangor, Malaysia
- Khan, M.** 1996. A Typology of Corrupt Transactions in Developing Countries'. *IDS Bulletin* 27 (2).
- Khare et al.** 2000. *India Country Study. Joint forest management: policy, practice and prospects.* Policy that works for forests and people series No. 3. London, International Institute for Environment and Development.
- Khare, A., Sarin, M., Saxena, N.C., Palit, S., Bathla, S., Vania, F. & Satyanarayana, M.** 2000. *Joint forest management: policy, practice and prospects.* London, UK: International Institute for Environment and Development.
- Khor, M.** 2000. *Globalization and the South: some critical issues.* UNCTAD Discussion paper, Geneva, Switzerland: United Nations Conference on Trade and Development (UNCTAD).
- Killmann, W., Sickinger & Thong.** 1994. *Restoring & Reconstructing The Malay Timber House.* Kuala Lumpur. Forests Research Institute Malaysia.
- Klabbers, J.** 1999. *Forest Certification and the WTO.* European Forest Institute Discussion Paper 7.
- Kleitz, A.** 2002. *Costs and Benefits of Trade Facilitation.* International Forum on Trade Facilitation. May 2002. Geneva.
- Koenig, D.** 1996. *New Approaches to Achieve Sustainable Management of Tropical Timber.* Wolfrum R. (ed), Enforcing Standards: Economic Mechanisms as Viable Means? Springer, Berlin-Heidelberg.
- Kopp, R. & Smith V.K.** (eds). 1993. *Valuing Natural Assets: The Economics of Natural Resource Damage Assessment.* Washington DC, USA: Resources for the Future.
- Korten, D.C.** 1995. *When corporations rule the world.* London, UK: Earthscan.
- Kosak, R. & Spelter, H.** 2003. Globalization revolutionising sawn softwood markets in 2002-2003. In *UNECE/FAO Forest products annual market analysis, 2002-2004.* Rome, Italy: UNECE/FAO.
- Kotey et al.** 1998. *Ghana Country Study. Falling into place,* Policy that works for forests and people series No. 4. London, UK: International Institute for Environment and Development (IIED).
- Kotey, N.A., Francois, J., Owusu, J.G.K., Yeboah, R., Amanor, K. & Antwi, L.** 1998. *Falling into place. Ghana country study.* Policy that Works for Forests and

- People series no. 4. London, UK, International Institute for Environment and Development. (IIED).
- Laarman, J.** 1999. Government Policies Affecting Forests. in K. Karpi (ed.) *Forest Resource Policy in Latin America*. Washington DC, UK: Inter-American Development Bank and John Hopkins University Press, pp.11-38.
- Laird, S. & Vassenaar, R.** 1991. *Porqué nos preocupan las bareras no arancelarias?* Informacion Comercial Española, Sdpecial issue on non-tariff barriers.
- Landell-Mills, N.** 1997. *Stumpage value appraisal for log extraction in Guyana: report based on eight case studies*. Confidential briefing paper. Georgetown, Guyana: Guyana Forestry Commission.
- Landell-Mills, N. & Ford, J.** 1999. *Privatising sustainable forestry A global review of trends and challenges*, Instruments for sustainable private sector forestry series. London, UK: International Institute for Environment and Development (IIED).
- Landell-Mills, N. & Porras, I.** 2002a. *Silver Bullet or Fools' Gold? A global review of markets for forest environmental services and their impacts on the poor*. Instruments for sustainable private sector forestry series. London, UK: International Institute for Environment and Development (IIED).
- Landell-Mills, N. & Porras, I.** 2002b. Silver bullet or fools' gold? In *A global review of markets for forest environmental services and their impacts on the poor*. London, UK: International Institute for Environment and Development (IIED).
- Lawson, S.** 2001. *Timber trafficking. Illegal logging in Indonesia, South East Asia and international consumption of illegally sourced timber*. London, UK: Environmental Investigation Agency (EIA).
- Le Billon, P.** 1999. *The politicisation of a commodity: the case of Cambodian timber*. Unpublished mimeo. Oxford, UK: School of Geography, University of Oxford.
- Leite, C. & Weidmann, J.** 1999. *Does Mother Nature Corrupt? Natural Resources, Corruption and Economic Growth*. IMF Working Paper 99/85. African and Research Departments. Washington DC: International Monetary Fund.
- Leslie, A.J.** 1996. *Trade and Environment Relating to Forest Products and Services*. Prepared for the Intergovernmental Panel on Forests.
- Leubuscher, S.** 2003. *Multinational enterprises – masters of the legal universe*. Special report. Brussels, Belgium: FERN.
- Lindsey, J., Mekouar, A. & Christy, L.** 2002. *Why Law Matters, Design Principles for Strengthening the Role of Forestry Legislation in Reducing Illegal Activities and Corrupt Practices*. FAO Legal Papers Online #27April 2002. Rome.
- Lippke, B. & Bishop, J.** 1999. The Economic Perspective in M. L. Hunter (ed) *Maintaining Biodiversity in Forest Ecosystems*. Cambridge, UK: Cambridge University Press.
- Lofdahl, C.** 2002. *Environmental Impacts of Globalization and Trade. A Systems Study*. Cambridge, USA: MIT Press.
- Lopez, R.** 1998. The tragedy of the commons in Cote d'Ivoire agriculture: empirical evidence and implications for evaluating trade policies'. *World Bank Economic Review* 12 (1): 105-132.
- Lu, W., Landell-Mills, N., Jinlong, L., Jintao, X. & Can, L.** 2002a. *Getting the private sector to work for the public good*. London, UK: International Institute for Environment and Development.
- Lyke, J.** 1998. The impact of the North American Free Trade Agreement on US forest products trade with Canada and Mexico; an assessment. *Forest Products Journal*. 48 (1): 23-38.

- Mabey, N. & McNally, R.** 1999. *Foreign Direct Investment and the Environment: from Pollution Havens to Sustainable Development*. London, UK: WWF-UK.
- Macqueen, D.J.** 2001. *Evidence-based policies for good governance – The applicability of growth and yield modelling to the forest sector in Guyana*. London, UK: International Institute for Environment and Development.
- Macqueen, D.J., Barrance, A. & Holt, G.** 2001. Common problems of the forest-dependent poor and priority research and development themes to address them. *International Forestry Review* 3 (2): 105-120.
- Macqueen, D.J., Grieg-Gran, M., Lima, E., MacGregor, J., Merry, F., Prochnik, V., Scotland, N., Smeraldi, R. & Young C.** 2003. *Growing Exports: The Brazilian tropical timber industry and international markets*. London, UK: International Institute for Environment and Development (IIED).
- Maddison, A.** 2001. *The world economy*. Paris, France: Organisation for Economic Co-operation and Development (OECD).
- Madeley, J.** 1999. *Big Business. Poor Peoples - the impacts of transnational corporations on the world's poor*. London, UK: Zed Books.
- Madhvani, A.** 1999. Working Draft: *An Assessment of Data on ODA: Financial Flows in the Forest Sector*, Programme on Forests. New York. USA (available at www.org.odi/fpeg/ODAflows/)
- Mahar, D.** 1988. *Government policies and deforestation in Brazil's Amazon Region*. Environment Department Working Paper n.7. Washington DC, USA: World Bank.
- Mahar, D. & Schneider, R.** 1994. Incentives for tropical deforestation: some examples from Latin America', in K. Brown and D. Pearce (eds) *The causes of tropical deforestation*. London: University College London Press.
- Mahendra, J.** 1999. Working Draft: *Financing Sustainable Forestry: Issues under International Deliberation*, Programme on Forests. New York. USA
- Mantau, U., Mertens, Welcker & Malzburg.** 2001. *Beiträge zur Vermarktung der Umwelt - und Erholungsleistungen des Waldes*. Deutscher landwirtschaftsverlag GmbH. München. Gemany.
- Mantau, U., Heuvelop, J. & Carsten, T.** 2002. *Zertifizierung von Holz Kenntnisstand und Meinungen der Zielgruppen. Kommentierter Bericht*. HEINZE
- Mäntyranta, H.** 2002. *Forest Certification: An ideal that became an absolute*. Metsälehti Kustannus. Finland
- Maplesden, F., & Clarke, M.** 2000. *Key trade issues in paper and forest products after Seattle*, FAO, ACPWD, Rotorua.
- Marshall & Jenkins.** 1994. *Hard Times for Hardwood: Indigenous Timber and the Timber Trade in Kenya*. Traffic International. Cambridge. UK
- Matthews, E.** 2001. *Understanding the FRA 2000*. Forest Briefing no.1. Washington DC: World Resources Institute
- Matthews, E., Payne, R., Rohweder, R. & Murray, S.** 2000. *Pilot Analysis of Global Ecosystems - Forest Ecosystems*. Washington DC: World Resources Institute.
- May, P. & Veiga Neto, F.** 2000. *Barreiras a Certificação Florestal na Amazônia Brasileira: A Importância dos custos*. Pro-Natura, IIED, GTZ. Report prepared for Brazil country study of the IIED project: Instruments for sustainable private sector forestry.
- Mayers, J. & Bass, S.** (1999.) *Policy that works for forests and people. Series overview*. London, UK: International Institute for Environment and Development (IIED).
- Mayers, J. & Vermeulen, S.** 2002. *Company community forestry partnerships - from raw deals to mutual gains?* London, UK: International Institute for Environment and Development (IIED).

- Mayers, J.** 2000. Company-community forestry partnerships: a growing phenomenon. *Unasylva* 51 (200).
- Mayers, J., Bass, S. & Macqueen, D.J.** 2002. *The Pyramid: a diagnostic and planning tool for good forest governance*. London, UK: International Institute for Environment and Development (IIED).
- Mayers, j., Bird, N. & Sibale.** 2001. *Forestry Tactics: Lessons from Malawi's*, National Forestry Programme. London, UK: International Institute for Environment and Development.
- Mayers, J., Evans, J. & Foy, T.** 2001. *Raising the stakes Impacts of privatization, certification and partnerships in South African forestry*. London, UK: International Institute for Environment and Development (IIED).
- McGuire, G.** 2002. *Trade in Services – Market Access Opportunities and Benefits of Liberalization for Developing Economies. Policy issues in international trade and commodities study series No. 19*, UNCTAD.
- McGuirk, A.** 2002. The Doha Development Agenda, *Finance and Development* 39 (3).
- MCPFE.** 2000a. Sustainable Forest Management Certification. In *Frame Conditions, System Designs and Impact Assessment*. Vienna. Austria.
- MCPFE.** 2000b. *The Role of Forests and Forestry in Rural Development - Implications for Forest Policy*. International Seminar, 5-7 July 2000, Vienna/Austria. A contribution to the Work of the MCPFE. Vienna. Austria.
- MCPFE.** 2002a. 4th Ministerial Conference on the Protection of Forests in Europe (UNECE). 2002b. State of Europe's Forests 2003. The Report on Sustainable Forest Management in Europe (Germany, Austria). Vienna. Austria.
- MCPFE.** 2003a. Implementation of MCPFE Commitments. In *National and Pan-European Activities 1998 - 2003*. Vienna. Austria.
- MCPFE.** 2003b. *Where to find Forest Data. A Pan-European Overview of International Institutions and Networks*. Vienna. Austria.
- Meidinger, E., Elliott, C. & Oesten, G.** 2003. *Social and Political Dimensions of Forest Certification* (available at www.forstbuch.de).
- Melchior, A.** 2001. Global Income inequality. Beliefs, facts and unresolved issues. *World Economics* 2: 87-107.
- Mendelsohn, R. & Neumann, J.** (eds). 1998. *The Impacts of Climate Change on the American Economy*. Cambridge, UK: Cambridge University Press.
- Mersmann, C.** 1998. *Six Country Initiative Putting the IPF Proposals for Action into Practice*. Mersmann, C. and Steigerwald, M. GTZ. Ecsborn. Germany
- Michaelowa, A.** 1996. *Trade and Labelling of Timber and Timber Products*. HWWA Institut für Wirtschaftsforschung.
- Michie, B. & Kin, S.** 1999. *A global study of regional trade flows of five groups of forest products*. Helsinki, Finland: European Forest Institute.
- Migot-Adholla, S., Hazell, P., Barel, B., & Place, F.** 1991. Indigenous land rights systems in sub-Saharan Africa: a constraint on productivity? *World Bank Economic Review* 5 (1):155-75.
- Ministerial Conference on the Protection of Forests in Europe.** 2000a. *The Role of National Forest Programmes in the Pan-European Context*. Presentations and outcomes of the NFP workshop organised by the MCPFE in Tulln, Austria, 13-14 September 1999. Vienna. Austria.
- Ministerial Conference on the Protection of Forests in Europe.** 2000b. *Ten Years of Commitment to European Forests: The Ministerial Conference on the Protection of Forests in Europe*. Vienna. Austria.

- Ministerial Conference on the Protection of Forests in Europe.** 2000c. *General Declarations and Resolutions Adopted at the Ministerial Conferences on the Protection of Forests in Europe*, Strasbourg 1990 - Helsinki 1993 - Lisbon 1998. Vienna. Austria.
- Ministerial Conference on the Protection of Forests in Europe.** 2001. *The MCPFE and the IPF/IFF Proposals for Action*, MCPFE Paper 1. Vienna. Austria.
- Mitchell, R. & Carson, R.** 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Washington DC, USA: Resources for the Future.
- Morozow, A.** 2000. *Survey of Illegal Forest Felling Activities in Russia*. Greenpeace.
- Moura-Costa, P., Fretz, L. and Kohn, G.** 2001. *Assessing the feasibility and operationalisation of an Investment Promotion Entity (IPE) for sustainable forest management*. Paper presented at an international workshop on financing sustainable forest management, 22-25 January 2001, Oslo, Norway. Oxford: EcoSecurities.
- MTCC.** 2001. Malaysian Timber Certification Council.(available at www.mtcc.com.my) Accessed 12/2/03.
- Munasinghe, M & Lutz, E.** 1993 Environmental Economics and Valuation in Development Decision Making. In M Munasinghe (ed) *Environmental Economics and Natural Resource Management in Developing Countries*. Washington DC, USA: World Bank.
- Muraille, B. & Ozinga, S.** 2002. *Status of Implementation of Forest-Related Clauses in the CBD: an independent review and recommendations for action*, by Global Forest Coalition. Fern. Brussels, Belgium.
- Murshed, S. M.** 2002. *On Natural Resource Abundance and Underdevelopment*. The Hague, Netherlands Institute of Social Studies.
- Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B & Kent, J.** 2000. Biodiversity hotspots for conservation priorities. *Nature* 403, 24 February 2000: 853-858.
- Narayan, D., Chambers, R., Shah, M. and Petesch, P.** 1999. *Global synthesis – consultations with the poor*. Draft World Bank Report for discussion. 20 September 1999. Washington DC, USA: World Bank.
- Nasi, R., Wunder, S. & Campos, J.J.A.** 2002. *Forest ecosystem services: can they pay our way out of deforestation?* Prepared for the GEF Forestry Roundtable, Costa Rica, 11 March. Washington DC, USA: Global Environment Facility.
- Nepstad, D.C., McGrath, D., Alencar, A., Barros, A., Carvalho, G., Santilli, M. & Vera Diaz, M.** 2002. Frontier Governance in Amazonia. *Science* 295 (5560): 1643-1644.
- Nepstad, D.C., Copobianco, J.P., Barros, A.C., Carvalho, G., Moutinho, P., Lopes, U. & Lefebvre, P.** 2000. *Avança Brasil - os custos ambientais para a Amazônia*. Belém, Brasil: Instituto de Pesquisa Ambiental da Amazônia.
- Nepstad, D.C., Verissimo, A., Alencar, A., Nobre, C., Lima, E., Lefebvre, P., Schlesinger, P., Potter C., Moutinho, P., Mendoza, E., Cochrane, M. & Brooks, V.** 1999. Large-scale impoverishment of Amazonian forests by logging and fire. *Nature*: **398**, 8 April 1999: 505-508.
- NERA.** 1999. Merger appraisal in oligopolistic markets Office of Fair Trading Research paper 19. Prepared for the Office of Fair Trading by National Economic Research Associates.
- Neumayer, E.** 2001. *Greening Trade and Investment. Environmental Protection without Protectionism*. London, UK: Earthscan.

- Nhira et al.** 1998. *Zimbabwe Country Study. Contesting inequality in access to forests.* Policy that works for forests and people series No. 5. London, UK: International Institute for Environment and Development (IIED).
- Nordhaus, W., and Boyer, J.** 1999. *Warming the World: Economics Models of Global Warming.* Cambridge: MIT Press.
- Nordström, H & Vaughan, S.** 1999. *Trade and Environment 1999.* Special Studies 4. Geneva, Switzerland: World Trade Organization (WTO).
- Nordström, H.** 2000. Trade, income disparity and poverty: an overview in D. Ben-David, H. Nordström and L.A. Winters *Trade, Income disparity and poverty.* Special Studies No. 5. Geneva, Switzerland: World Trade Organization, p.3.
- Norske Skog.** www.norske-skog.com
- Nussbaum, R., Gray, I., & Higman, S.** 2003. *Modular implementation and verification (MIV): a toolkit for the phased application of forest management standards and certification,* by. Oxford, ProForeset.
- NZIER.** 2000. *Real barriers to trade in forest products.* Working paper 2000/4, Wellington, New Zealand.
- ODA.** 1996. *Sharing forest management. Key factors, best practice and ways forward.* London, UK: ODA (now DFID).
- OECD.** 2001. *Agricultural Policies in OECD Countries: Monitoring and Evaluation 2001* (Paris: OECD).
- OECD.** 2003. *Forestry Projects: lessons learned and implications for CDM modalities.* Paris, France. OECD and IEA Information paper.
- OECD & UNDP.** 2002. *Sustainable Development Strategies: A Resource Book.* London, UK. Earthscan
- Oksanen, T. & Mersmann, C.** 2002. Forests in Poverty Reduction Strategies: An assessment of PRSP processes in Sub-Saharan Africa' In T. Oksanen, B. Pajari and T. Tuomasjukka (eds) *Forests in Poverty Reduction Strategies: Capturing the Potential.* European Forestry Institute Proceedings 47, Joensuu, Finland (available at <http://www.efi.fi/publications/Proceedings/>)
- Oksanen, T.** 1998, Working Draft: *National Forest Programmes and Forest Partnership Agreements.* Programme on Forests. PROFOR. UNDP. New York. USA
- Oman, C.P.** 2000. *Policy Competition for Foreign Direct Investment. A Study of Competition among governments to attract FDI.* Paris, France: OECD.
- Overall, W.L.** 2001. O peso dos invertebrados na balança de conservação biológica da Amazônia in *Biodiversidade na Amazônia Brasileira.* São Paulo, Brazil: Instituto Socioambiental, pp. 50-59.
- Overseas Development Institute.** 1998. *The EU Tropical Forestry Sourcebook.* London. ODI. London, UK.
- Oxfam.** 2002. *Rigged Rules and Double Standards: trade, globalisation and the fight against poverty (2 vols) (available at www.markettradefair.com)* .Oxfam.
- Oxfam.** 2003. *Dumping Without Borders: How US agricultural policies are destroying the livelihoods of Mexican corn farmers.* Oxfam Briefing Paper 50.
- Pagiola, S., Bishop, J., Landell-Mills, Natasha.** 2002. *Selling Forest Environmental Services Market-based Mechanism for Conservation and Development.* IIED/WWF/World Bank Institute. Earthscan. London.
- Pandy, D.K. & Wheeler, D.** 2002. *A Revised Forest Strategy for the World Bank Group.* The World Bank Group. Washington D.C. USA.
- Paperloop.** 1999. Stora Enso Company Profile. (available at www.paperloop.com).
- Paperloop.** 2001. Grade Centers North American Industry Structure Market Pulp. (available at www.paperloop.com).

- Paperloop.** 2002. U.S. timberland sales exceed \$1.4 billion. (available at www.paperloop.com/db_area/archive/pponews/2002/wk09_23_2002/06_key.shtml). September 2002.
- Paperloop.** 2003. May 28 UPM Kymmene sheds more light on China pulp mill plans; June 10 2003 Oji Paper plans mammoth 1.2 million tonne expansion in China. (available at www.paperloop.com/newsinfo/corporate/copro/kruger/overview_key.shtml)
- Pearce, D.** 2002. *Environment and Economic Development*. Cheltenham, UK: Edward Elgar.
- Pearce, D.W. & Pearce, C.G.** 2001. *The Value of Forest Ecosystems*. Report to the Secretariat of the United Nations Convention on Biological Diversity, Montreal, Canada. London: CSERGE.
- Pearce, D.W., Markandya, A. & Barbier, E.B.** 1989. *Blueprint for a Green Economy*. London: Earthscan.
- Pearce, D.W., Moran, D. & Krug, W.** 1999. *The Global Value of Biological Diversity: A Report to the United Nations Environment Programme*. London, UK: CSERGE.
- Peck, T.** 2001. *The International Timber Trade*. Cambridge, UK: Woodhead Publishing Company.
- PEFC.** 2002. Pan-European Forest Certification scheme. Luxembourg The PEFC Council. (available at www.pefc.org).
- Peluso, N.L. & Padoch, C.** 1996. Changing resource rights in managed forests of West Kalimantan. in C. Padoch and N.L. Peluso. (eds) *Borneo in transition: people forests, conservation and development*. Singapore: Oxford University Press, pp. 121-136.
- People's Republic of China, State Forest Administration.** 2001. *China's Forest Resource Statistics*. Beijing: China's Forestry Press.
- Pepke, E.** 2002. Certified Forest Products. UNECE Timber Committee, 60th Session, 24/27 September.
- Percival, D.** 1996. *Conservation of West Africa's forests through certification*. The Courier ACP-EU No 157,
- Perez-Garzia, J.** 2001. *The Effect of a Tariff Elimination Policy on the Forest Sector: A Global Perspective*. CINTRAFOR.
- Perez-Garzia, J., Lippke, B. & Baker, J.** 1997. *Trade Barriers in the Pacific Forest Sector: Who Wins and Who Loses*. Contemporary Economic Policy, Vol XV.
- Pesendorfer, M.** 1998. *Horizontal Mergers in the Paper Industry* Working Paper 6751 National Bureau of Economic Research. (available at www.nber.org/papers/w6751)
- Pfaff, A.S.P.** 1996. *What drives deforestation in the Brazilian Amazon? Evidence from satellite and socioeconomic data*. New York, USA: Columbia University.
- Pimm, S.L. & Raven, P.** 2000. 'Extinction by numbers'. *Nature* 403, 24 February 2000: 843-845.
- Poschen, P.** 1997. Forests and employment – much more than meets the eye' in *The economic contribution of forestry to sustainable development*. Proceedings of the XI World Forestry Congress, 13-22 October 1997, Ankara, Turkey.
- Poschen, P.** 2000. *Social criteria and indicators for sustainable forest management. A guide to ILO texts*. Geneva, Switzerland: International Labour Organization.
- PPI.** 2002. Annual Review. *Pulp and Paper International* July 2002.
- PROFOR.** 2003a. *Implementing the proposals for action of the intergovernmental panel on forest and the intergovernmental forum on forest*. Program on Forests (PROFOR), Department of Agriculture, Fisheries and Forestry-Australia (AFFA).
- PROFOR.** 2003b. Vietnam (available at www.profor.info/pages/country/2_5.html)

- PROFOR-UNDP.** 2000. 1. Cameroon. 2. Guyana Forest Commission, National Workshop on Forest Certification, Georgetown. 3. National Forestry Programme, Assessment of the Operational Context of NTFP and their Potential Contribution to Sustainable Forestry Management. 4. Malawi National Forestry Programme, Working Paper Series. Initial thoughts on decentralisation and the future management of forests goods and services? PROFOR, New York. (available at www.profor.info/pages/country/index.htm).
- Putz, F.E., Dykstra, D.P. & Heinrich, R.** 1999. *Why poor logging practices persist in the tropics*. Bogor, Indonesia: Centre for International Forestry Research (CIFOR).
- Putz, F.E., Redford, K.H., Robinson, J.G., Fimbel, R. & Blate, G.M.** 2000. *Biodiversity conservation in the context of tropical forest management*. World Bank Environment Department Papers No. 75. Washington DC, USA: World Bank.
- Rainforest Foundation.** 2001. *Indigenous peoples*. (available at www.rainforestfoundationuk.org)
- Rametsteiner, E.** 2000. *Sustainable Forest Management Certification: Frame Conditions, System Designs and Impact Assessment*. Vienna, Austria. MCPFE.
- Rametsteiner, E. & Kraxner, F.** 2003. Markets for certified products 2002-2003. In UNECE/FAO *Forest products annual market analysis, 2002-2004*. Rome, Italy: UNECE/FAO.
- Rametsteiner, E., Schwarzbauer, P., Juslin, H., Becker, M. & Kühn, T.** 1998. *Potential Markets for Certified Forest Products in Europe*. EFI. Joensuu.
- Raunetsalo, J., Dr. Juslin, H., Dr. Hansen, E., & Forsyth, K.** 2002. *Forest Certification update for the Unece region*, by. Geneva Timber and Forest Discussion Papers. UNECE/FAO. Geneva. Switzerland.
- Raunekar, R. & Buongiorno, J.** 1999. *Le rôle joué par l'économie dans la gestion forestière: de Faustmann à la courbe environnementale de Kuznets*. Revue Forestière Française.
- RECOFTC.** 2003. (available at <http://www.recoftc.org/forgov.html>) Regional Community Forestry Training Center for Asia and the Pacific.
- Reed, D.** 1996. *Structural Adjustment, the Environment, and Sustainable Development*. Earthscan Publications Ltd. London.
- Reed, D.** 2002. *Economic Change, Governance and Natural Resource Wealth. The Political Economy of Change in Southern Africa*. London, UK: Earthscan.
- Repetto, R. & Cruz, W.** 1992. *The Environmental Effects of Stabilization and Structural Adjustment Programs: The Philippines Case Study*. World Resources Institute. Washington, D.C.
- Repetto, R. & Gillis, M.** 1988. *Public Policies and the Misuse of Forest Resources*. Cambridge, UK: Cambridge University Press.
- Repetto, R.** 1990. *Deforestation in the Tropics*. Scientific American, 262(4).
- Repetto, R.** 1993. *Trade and Environment Policies: Achieving Complementarities and Avoiding Conflicts*. WRI. Issues and Ideas. July 1993.
- Report on the Working Group on Methodology.** 1998. The Convention on Biological Diversity and the International Trade Regime. 25 February 1998. Gland.
- Rescher, N.** 1993. *Pluralism: Against the demand for consensus*. Oxford, UK: Clarendon Press.
- Retallack, S.** 2001. 'The environmental cost of economic globalisation' in E. Goldsmith and J. Mander *The case against the global economy*. London, UK: Earthscan, pp.189-202.
- Ribeiro, J., Hopkins, M.J.G., Vicentini, A., Sothers, C.A., Costa, M.A., de Brito, J.M., de Souza, M.A., Martins. L.H.P., Lohmann, L.G., Assunção, P.A.C.L.,**

- Pereira, E., da Silva, C.F., Mesquita, M.R. & Procópio, L.C.** 1999. *Flora da Reserva Ducke*. Manaus, Brazil: INPA.
- Ribot, J.** 2002. Democratic Decentralization of Natural Resources, Institutionalizing Popular Participation. Washington DC: World Resources Institute.
- Rice, T., Ozinga, S., Marijnissen, C. and Gregory, M.** 2000b. *Trade Liberalisation and its Impacts on Forests. An overview of the most relevant issues*. Brussels, Belgium: Fern.
- Richards, M.** 2000. Can sustainable tropical forestry be made profitable? The potential and limitations of innovative incentive mechanisms. *World development* 28 (6): 1001-1016.
- RIIA.** 2002. *Blueprint to Stop Illegal Logging*. Royal Institute of International Affairs.
- Risse, T.** 2003. Conference Report: *Challenging Global Governance* (January 6-8 2003). Berlin, Germany. Center for Transatlantic Security- and Foreign Policy.
- Ross, M.L.** 2001. *Timber Booms and Institutional Breakdown in Southeast Asia*. Cambridge, UK: Cambridge University Press.
- Rytkönen, A.** 2002. *Market Access of Tropical Timber*. Report to be submitted to the International Tropical Timber Council Pursuant to ITTC Decision 6 (XXXI). Helsinki, Finland.
- Rytkönen, A.** 2003. *Market Access of Tropical Timber Thirty-fourth Session, 12-17 May 2003*, by. Panama City, Panama. Yokohama. Japan. International Tropical Timber Organisation (ITTO).
- Rytkönen, A.** 2003. *Revenues from Forests of Mozambique, improving the system of collection*. For DNFFB, PROAGRI. IIED
- Saigal., Arora. & Rizvi.** 2002. *The new foresters: The role of private enterprise in the Indian forestry sector*. London, UK: International Institute for Environment and Development (IIED).
- Salim, E., Djalins, U. & Suntana, A.** 1997. *Forest Product Trade and Certification: An Indonesian Scheme*. Proceedings of the XI World Forestry Congress. Antalya.
- Salmi, J., Oksanen, T. & Simula, M.** 2001. *Assessing the feasibility and operationalisation of an Investment Promotion Entity (IPE) for sustainable forest management: demand and supply aspects*. Paper presented at an international workshop on financing sustainable forest management, 22-25 January 2001, Oslo, Norway. Helsinki, Finland: Indufor Oy.
- Samuelson, P.** 1983 Thunen at two hundred. *Journal of Economic Literature* 21(4):1468-88.
- Saunders, J., & Brack, D.** 2003. *Background study of tropical timber export and import trade statistics*. THE ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS. London, UK.
- Savenije, H.** 2000. *From political concept to practical instrument in developing countries*. National Forest Programmes. Theme studies Series 3. National Reference Centre for Nature Management (EC LNV). Wageningen, The Netherlands
- Scherr, S.** 1995. Economic factors in farmer adoption of agroforestry: patterns observed in western Kenya. *World Development* 23 (5):787-804.
- Schiff, M. & Valdés, A.** 1998. *Agriculture and the macroeconomy*. Policy Research Working Paper 1967. Washington, DC, USA: World Bank.
- Schneider, R.** 1994. *Government and the economy on the Amazon frontier*. LAC Regional Studies Program Report no.34. Washington, DC: The World Bank.
- Schneider, R., Arima, E., Veríssimo, A., Barreto, P. & C. Junior, Souza.** 2000. *Sustainable Amazon: limitations and opportunities for rural development*. World Bank Partnership Series 1. Brasília.

- Scolan, N. & Ludwig, S.** 2002. *Deforestation, the Timber Trade and Illegal Logging*. Paper prepared for the EC Workshop on Forest Law Enforcement, Governance and Trade. Brussels.
- Scoones, I.** 1998. *Sustainable Rural Livelihoods: A framework for analysis*. Working paper No. 72. Brighton, UK: Institute of Development Studies.
- Sedjo, R. & Solomon, A.** 1990. Climate and forests in N. Rosenburg, W. Easterling, P. Crosson, and J. Darmstadter (ed) *Greenhouse Warming: Abatement and Adaptation*. Washington DC, USA: Resources for the Future.
- Sedjo, R.** 1994. *The potential of high-yield plantation forestry for meeting timber needs: recent performance and future potentials*. Resources for the Future discussion paper 95-08. Washington DC, USA: Resources for the Future.
- Sedjo, R.** 1996. Local timber production and global trade: the environmental implications of forestry trade. in W. Adamowicz (ed.) *Forestry, Economics and the Environment*. Wallingford, UK: CAB International, pp.49-67.
- Sedjo, R.A. & Lyon, K.S.** 1990. *The Long-Term Adequacy of World Timber Supply*. Resources for the Future, Washington D.C.
- Sedjo, R.A. & Simpson, R.D.** 1999. *Tariff liberalisation, wood trade flows, and global forests*. Discussion Paper 00-05. Washington DC, USA: Resources for the Future.
- Seldon.** (19xx) *Forest Science*
- Seymour, F.J. & Dubash, N.K.** 2000. *The right conditions: the World Bank, structural adjustment, and forest policy reform*. Washington DC, USA: World Resources Institute.
- Shahin, M.** 2002. Trade and Environment: How Real is the Debate in K.P. Gallagher and J. Werksman (eds) *The Earthscan Reader on International Trade and Sustainable Development*. London, UK: Earthscan.
- Shell.** 2001. *Shell forests receive Forest Stewardship Council Approval* Royal Dutch Shell Group of Companies, Investor Relations News and Library 24/01/2001 (available at www.shell.com Viewed on 26/01/2003).
- Shiling, J.D. & Osha, J.** 2003. Paying for Environmental Stewardship. In *Using Markets and Common-Pool Property to Reduce Rural Poverty while Enhancing Conservation*. WWF Macroeconomic Program Office. Washington, USA.
- Simula, M. & Vehkamäki, S.** 1995. *Economic Effects of Biodiversity in Forestry*. IUFRO XX World Congress. Tampere.
- Simula, M.** 1997. *The Economic Contribution of Forestry to Sustainable Development*. Proceedings of the XI World Forestry Congress. Antalya.
- Simula, M.** 1999. Convention on Biological Diversity and the International Trade Regime: *The Case of Forests*. The World Conservation Union (IUCN). Helsinki.
- Singh, H.** 1994. *The green revolution in Punjab: the multiple dividend, prosperity, reforestation and the lack of rural out-migration*. Unpublished student paper, JFK School of Public Policy, Harvard University.
- Sizer, N. & Plouvier, D.** 1998. *Increased investment and trade by transnational logging companies in Africa, the Caribbean and the Pacific: implications for the sustainable management and conservation of tropical forests* (Draft). Belgium: Worldwide Fund for Nature.
- Sizer, N., Downes, D. & Kaimowitz, D.** 1999b. Tree trade. Liberalisation of international commerce in forest products: risks and opportunities. *World Resource Institute Forest Notes* November 1999. Washington DC, USA: World Resources Institute.
- Skala-Kulmann, A.** 1998. *Implementations of the IPF Proposals for Action in the Light of Relevant International Legally-binding Instruments*. Discussion Paper for the

- IUCN Side Event at the Second Session of the UN Intergovernmental Forum on Forests (IFF2). Geneva, 28 August 1998.
- Solberg, B.** (ed.). 1996. *Long-term Trends and Prospects in World Supply and Demand for Wood and Implications for Sustainable Forest Management*. European Forest Institute Research Report No 6. Joensuu.
- Southgate, D., Salazar-Canelos, P., Camacho-Saa, C. & Stewart, R.** 2000. Markets, Institutions and Forestry: The Consequences of Timber Trade Liberalisation in Ecuador. *World Development* **28**: 2005-2012.
- Staples, B. R.** 1998. *Trade Facilitation*. Global Trade Negotiations Home Page
- Stern, D.** 2002. Progress on the Environmental Kuznets Curve? in K.P. Gallagher and J. Werksman (eds) *The Earthscan Reader on International Trade and Sustainable Development*. London, UK: Earthscan.
- Stevens, P.** 2003. *Resource Impact - curse or blessing - A literature survey*. Dundee, UK: University of Dundee.
- Stiglitz, J.** 1998. *Towards a new paradigm for development: strategies, policies and processes*. 1998 Prebisch Lecture at UNCTAD, Geneva, 19 October 1998.
- Stiglitz J.** 2002. *Globalization and its Discontents*. New York, USA: W.W. Norton.
- Tarasofsky, R.G.** 1995. *The International Forests Regime: Legal and Policy Issues*. IUCN. Gland.
- Tarasovsky, R.G.** 2000. *The WTO Committee on Trade and Environment: Is it making a Difference?* Geneva: World Trade Organization (WTO).
- Tarasovsky, R.G.** 2002. *Towards a mutually supportive relationship between the Convention on Biological Diversity and the World Trade Organization: An Action Guide*. ICUN, Gland, Switzerland and Cambridge UK.
- Tarasofsky, R. G. & Pfahl, S.** 2001. *Trading away the ancient forests*. London, UK: Greenpeace International.
- Taubenbeck, S.** 1992. The postmodern forest: Images differing in Centre for Applied Ethics working paper on *Environmental ethics: sustainability, competition and forestry*. British Columbia: University of British Columbia, pp10-22. (available at www.ethics.ubc.ca/susdev.html).
- The Rainforest Foundation.** 2002. *Trading in Credibility*. London, UK.
- Thomson, J. & Kanaan, R.** 2003a. *Conflict Timber: Dimensions of the Problem in Asia and Africa - Volume 1*. USAID – ARD. Vermont, USA
- Thomson, J., Kanaan, R., Baker, M., Clausen, Robert., N'Goma, M.& Roule, T.** 2003c. *Conflict Timber: Dimensions of the Problem in Asia and Africa" - Volume 3*. USAID – ARD. Vermont, USA
- Thomson, J., Malley, M., Kanaan, R., Roule, Trifin. & Jarvie, J.** 2003b. *Conflict Timber: Dimensions of the Problem in Asia and Africa" - Volume 2*. USAID – ARD. Vermont, USA
- Thornber, K.** 1999. *Trends in FSC certification*. Report for instruments for sustainable private sector forestry programme, IIED, London, UK.
- Tickell, O.** 2000. *Certification: a future for the world's forests*. WWF UK. (available at www.panda.org/forest4life).
- Tisdell, C.** 2001. Globalisation and sustainability; environmental Kuznets curve and the WTO. *Ecological Economics* 39 (2001): 185-196.
- Tissari, J.** 2003. Trade in secondary-processed wood products slowed: value added wood product markets, 2001-2003. In UNECE/FAO *Forest products annual market analysis, 2002-2004*. Rome, Italy: UNECE/FAO.

- TMFW.** 2001. Globalization and sustainability. Report for discussion at the Tripartite Meeting on the Social and Labour Dimensions of the Forestry and Wood Industries on the Move. Geneva, Switzerland: TMFW, International Labour Organization.
- Tockman, J.** 2001. *The IMF-Funding Deforestation*. Washington DC, USA: American Lands Alliance.
- Tomberlin, D. & Buongiorno, J.** 2000. Timber plantations, timber supply and forest conservation, in M. Palo, J. Uusivuori and G. Mery (eds.), *World Forest, Markets and Policies*.
- Townson, I.M.** 1995. *Forest products and household incomes. A review and annotated bibliography*. Tropical Forestry Papers No. 31. Oxford, UK: Oxford Forestry Institute.
- Toyne, P., O'Brien, C. & Nelson, R.** 2002b. *The timber footprint of the G8 and China. Making the case for green procurement by government*. WWF International. Gland, Switzerland.
- Treisman, D.** 2000. The Causes of Corruption: A Cross-National Study. *Journal of Public Economics* 76: 399-457.
- Trexler, M.** 1999. Working Draft: *Innovative Forest Financing Options and Issues: Forest Conservation and Management for Climate Change Mitigation*. Programme on Forests. New York. USA.
- UN/ECE/EC.** 2000. *Convention on Long-Range Transboundary Air Pollution. International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests.*, European Union Scheme on the Protection of Forests against Atmospheric Pollution. Federal Research for Forestry and Forest Products (BFH). Geneva and Brussels.
- UN/FAO.** 2002. *Produits forestiers revue annuelle du marché*. Volume LV, No. 3. Geneva. Switzerland
- UN/FAO/RWEDP.** (Rural Wood Energy Development Program). 2000) *Wood Energy News* 15(1). Bangkok, Thailand: UN/FAO RWEDP.
- UNCTAD.** 2002. *World Investment Report 2002: Transnational Corporations and Export Competitiveness*. Geneva. Switzerland
- UNCTAD.** 2003. *Back to Basics: Market Access Issues in the Doha Agenda*. UN New York and Geneva.
- UNCTAD TRAINS.** 2003. *Trade Analysis and Information System*. UN New York and Geneva.
- UNCTC.** 1985. *Environmental Aspects of the Activities of Transnational Corporations: A Survey*. United Nations, New York.
- UNDP.** 1996. Workshop Proceedings: *Financial Mechanisms and Sources of Finance for Sustainable Forestry, 4-7 June 1996, Pretoria, South Africa*. New York USA
- UNDP.** 1999. Workshop Report: *Financing of Sustainable Forest Management*. Programme on Forests. New York. USA
- UNDP.** 2003. *Making global trade work for people*. New York. USA
- UNECE/FAO.** 2000. *UNECE/FAO Contribution to the Global Forest Resources Assessment 2000, Main Report*. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand. Geneva. Switzerland
- UNECE/FAO.** 2001a. *Forest Policies and Institutions in Europe 1998-2000*. Geneva Timber and Forest Study Papers. Geneva. Switzerland.
- UNECE/FAO.** 2001b. *Forest Products Annual Markets in 2001 and Prospects for 2002*. Timber Bulletin - Volume LIV (2001), No.6. Geneva. Switzerland.
- UNECE/FAO.** 2002a. *Timber Committee Yearbook 2002*. Geneva. Switzerland.

- UNECE/FAO.** 2002b. *Forest Products Annual Market Review 2001-2002*. Timber Bulletin - Volume LV (2002), No.3. Geneva. Switzerland.
- UNECE/FAO.** 2002c. *Forest Products Statistics 1996-2000*. Timber Bulletin - Volume LIV (2001), No.2. Geneva. Switzerland.
- UNECE/FAO.** 2002d. *Forest Products Trade Flow Data 1999-2000*. Timber Bulletin - Volume LV (2002), No.5. Geneva. Switzerland.
- UNECE/FAO.** 1998-2000. *Forest policies and institutions in Europe 1998-2000*. Geneva. Switzerland.
- UNEP.** 2000. *Environment & Trade: A Handbook*. International Institute for Sustainable Development (IISD). Hertfordshire. England.
- UNEP.** 2001. *UNEP Country Reports on Environmental Impacts of Trade Liberalisation*. (available at <http://www.unep.ch/etu/etp/events/recent/berdocs.htm>)
- UNEP.** 2002. *Capacity building on environment, trade and development: trends, needs and future directions*. UNEP Workshop on capacity building on environment, trade and development, 19/20 March. United Nations Environment Programme.
- UNEP.** *Multilateral Environmental Agreements from the Internet*. (available at www.unep.org)
- UNESCO.** 1997. *Report of the Ad Hoc Intergovernmental Panel on Forests on its fourth session*. United Nations Economic and Social Council. New York, USA
- UNESCO.** 2000. *Report of the Intergovernmental Forum on Forests on its fourth session*. United Nations Economic and Social Council. New York, USA.
- UNFF/ECOSOC.** 2002. Note of the Secretary General on Trade and Sustainable Forest Management. Second Substantive Session. March 2002.
- United States Department of Commerce.** 2001a. *Fixed Assets and Consumer Durable Goods for 1925-2000*. Survey of Current Business, September 2001.
- United States Department of Commerce.** 2001b. *Gross Domestic Product by Industry for 1998-2000*. Survey of Current Business November 2001.
- US Congress.** 1993. *Harmful Non-indigenous Species in the United States*. Office of Technology Assessment. Washington, D.C.
- US International Trade Commission.** 1999. *Conditions of Competition in U.S. Forest Products Trade*. ITC Publication 3246. Washington DC.
- USTR.** 1999. *Accelerated Tariff Liberalization in the Forest Products Sector: A Study of the Economic and Environmental Effects*. Washington DC, USA: Office of the US Trade Representative and White House Council on Environmental Quality.
- Utting, P.** 2002. *The greening of business in developing countries*. London, UK: Zed books.
- Vallejo, N. & Hauselmann, P.** 2000. *Institutional Requirements for Forest Certification*. GTZ. Echborn
- Van Gelder, J.W.** 1998. *Capital flows in Forestry Companies*. Report prepared for AID environment.
- Van Rijsoort, J.** 2000. NTFPs. *Their role in sustainable forest management in the tropics*. Theme Study 1. Forests, forestry and biological diversity support group. Wageningen, Netherlands: International Agriculture Centre.
- Vaughan, S.** 1996. *Trade and Labelling*. WTO.
- Verbelen, F.** 2001. *Cameroon Government expresses concern over illegal logging by European Companies*. www.fern.org/Library/FW/FW00/Report_Cameroon.htm.
- Verolme, H.J.H. & Moussa, J.** 1999. *Addressing the underlying causes of deforestation and forest degradation – case studies, analysis and policy recommendations*. Washington DC, USA: Biodiversity Action Network.

- Viana, V., May, P., Lago, L., Dubois, O. & Grieg-Gran, M.** 2002. *Instruments for Sustainable Private Sector Forestry in Brazil: an analysis of needs, challenges and opportunities for natural forest management and small-scale plantation forestry*. London, UK: International Institute for Environment and Development (IIED).
- Viking, B. & Issartel, M.** 1996. *Price Trends for Forest Products, 1964-91*. UNECE/FAO Timber and Forest Discussion Papers. New York and Geneva: United Nations.
- Vincent, J. R., Crawford, E.W. & Hoehn, J.P.** (eds) 1991. *Valuing Environmental Benefits in Developing Economies*. Proceedings of a seminar series, February–May 1990, at Michigan State University. East Lansing: Michigan State University.
- Vorley, B., Roe, D. & Bass S.** 2002. *Standards and Sustainable Trade: A Sectoral Analysis for the Proposed Sustainable Trade and Innovation Centre* International Institute for Environment and Development.
- Vrolijk, C.** 2000. Adding up Kyoto. *Environmental finance* 1 (8): 27-29.
- Waggoner, P. and Ausubel, J.H.** 2000. *How much will feeding more and wealthier people encroach on forests?* Prepared for project meeting 20-21 January 2000, Washington DC.
- Watson et al.** 1998. Costa Rica Country Study. *Making space for better forestry*. Policy that works for people and forests series No. 6. London, UK: International Institute for Environment and Development (IIED).
- WCMC.** 2002. United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC). (available at www.unep-wcmc.org)
- Wei, S.** 200?. *Natural Openness and Good Government*. NBER Working Paper 7765. Cambridge, USA: National Bureau of Economic Research.
- Weiss, L.** 1989. *Concentration and Price*, MIT Press: Cambridge, Mass
- Wenban-Smith, M., Nussbaum, R., Garforth, M., and Scrase, H.,** 2001, *Getting small forest enterprises into certification – an analysis of the barriers*. Proforest, UK.
- Westoby, J.** 1987. *The purpose of forests. Follies of development*. Oxford, UK: Basil Blackwell Ltd.
- Westoby, J.** 1989. *Introduction to world forestry*. Oxford, UK: Basil Blackwell Ltd.
- Weyerhaeuser.** (2002). **News Release October 22.**
- White, A. & Martin, A.** 2002. *Who Owns the World's Forests? Forest Tenure and Public Forests in Transition*. Washington DC, USA: Forest Trends.
- William, E.M.** 1998. Discussion Paper. *Entering the Fray - International forest policy processes: an NGO perspective on their effectiveness*, Policy that works for forests and people series No. 9. London, UK: International Institute for Environment and Development (IIED).
- Winpenny, J. T.** 1991. *Values for the Environment: A Guide to Economic Appraisal*. London, UK: HMSO.
- Wollenberg, E., Anderson, J. & Edmunds, D.** 2001. Pluralism and the less powerful: accommodating multiple interests in local forest management. *International Journal of Agricultural Resources, Governance and Ecology* 1 (3/4): 199-222.
- Wong, J. & Dutschke, M.** 2003. *Can Permanence be Insured? Consideration of some Technical and Practical Issues of Insuring Carbon Credits from Afforestation and Reforestation*. Discussion paper 235. HWWA Hambur. Hambur, Germany.
- Wood Resources International.** 1999. *Production Forest Estimates for Selected Countries*. Reston, Virginia, USA: Wood Resources International.
- Workshop on Trade and Biodiversity.** 1998. Global Biodiversity Forum 10. 1-3 May 1998. Bratislava.

- World Bank Institute.** 2003. (available at <http://www.worldbank.org/wbi/governance/index.html>) Washington DC, USA: World Bank Institute.
- World Bank.** 1992. *Governance and Development*. Washington D.C., USA: World Bank.
- World Bank.** 2000. *Greening Industry. New Roles for Communities, Markets, and Governments*. World Bank Policy Research Report. New York, USA: Oxford University Press.
- World Bank.** 2001a. *A revised forest strategy for the World Bank Group*. Washington DC, USA: World Bank.
- World Bank.** 2001b. *Global Economic Prospects 2002*. Washington, D.C.
- World Bank.** 2002. *Globalization, Growth and Poverty. Building an Inclusive World Economy*. A World Bank Policy Research Report. New York: World Bank and Oxford University Press.
- World Bank/IMF.** 2000. *A New Approach to Country-Owned Poverty Reduction Strategies*. Washington DC, USA: World Bank/IMF.
- World Rainforest Movement and Forests Monitor Ltd.** 1998. *High Stakes The Need to Control Transnational Logging Companies: A Malaysian Case Study*.
- World Resources Institute.** 2001a. *World Resources 2000-2001*. Washington DC: WRI in collaboration with UNDP, UNEP and the World Bank.
- World Resources Institute.** 2001b. *World Resources 2000-2001*. Washington DC: WRI in collaboration with UNDP, UNEP and the World Bank.
- World Trade Organization.** 2001. *Integrated Framework Diagnostic Trade Integration Study: Cambodia* (Geneva: World Trade Organization).
- WTO.** 1997. *Environmental Benefits of Removing Trade Restrictions and Distortions*. Committee on Trade and Environment. WT/CTE/W/67.
- WTO.** 1998. *Forests: A National Experience, Contribution by Canada*. Committee on Technical Barriers to Trade, WT/CTE/W/81.
- WTO.** 1999. *The Legal Texts: The Results of the Uruguay Round of the Multilateral Trade Negotiations*. Geneva: World Trade Organization (WTO).
- WTO.** 2001a. *GATS - Fact and Fiction*. Geneva: World Trade Organization (WTO).
- WTO.** 2001b. *WTO Policy Issues for Parliamentarians: A Guide to Current Trade Issues for Legislators*. Geneva: World Trade Organization (WTO).
- WTO.** 2002a. *Market Access for Non-Agricultural Products*. Communication from the United States. TN/MA/W/18 5 December. Geneva: World Trade Organization (WTO).
- WTO.** 2002b. *Doha Declarations*. Geneva: World Trade Organization (WTO).
- WTO.** 2002c. *The Road to Doha and Beyond - A Road Map for Successfully Concluding the Doha Development Agenda*. Geneva: World Trade Organization (WTO).
- WTO.** 2003a. *Understanding the WTO*. Genève, World Trade Organisation.
- WTO.** 2003b. *World Trade Organization 5th Ministerial Conference, Press Pack Briefing Notes*. Geneva: World Trade Organization (WTO).
- Wunder, S.** 2001. *Poverty Alleviation and Tropical Forests - What Scope for synergies?* Bogor, Indonesia: Center for International Forestry Research (CIFOR).
- Wunder, S.** 2003. *Oil wealth and the fate of tropical forests. A comparative study of eight tropical countries*. London, UK: Routledge.
- WWF.** 1998. *Developing a Methodology for the Environmental Assessment of Trade Liberalisation Agreements*. WWF International Discussion Paper. Gland, Switzerland: WWF International.
- WWF.** 2001. *How can Multilateral Trade Deliver Sustainable Development Outcomes?* Brussels, Belgium: WWF European Policy Office.

- WWF.** 2002. *Forests for Life: Working to Protect, Manage and Restore the World's Forests.*
- WWF.** 2003. *Conserving Nature - Partnering with People.* WWF International. Gland, Switzerland.
- www.ubsbrinson.com/timber/index.html Viewed on 1/18/01.
- www.weyerhaeuser.com. News Release October 22 2002
- XII World Forestry Congress.** 2003. *Second Announcement.* (www.wfc2003.org) Quebec, Canada.
- Xu, J. & Hyde, W.F.** 2002. *Stochastic frontier.*
- Yin, R. & Hyde, W.F.** 2000. Trees as an agriculture-sustaining activity: The case of Northern China. *Agroforestry Systems* 50:179-194.
- Yin, R. & Newman, D.H.** 1998. An intervention analysis of Hurricane Hugo's effect on South Carolina's stumpage prices. *Canadian Journal of Forest Research* 29:779-787.
- Young, C.** 1996. *Economic Adjustment Policies and the Environment: A Case Study of Brazil.* Unpublished PhD thesis, Department of Economics, University of London.
- Zhu, S., Buongiorno, J. & Brooks, D.J.** 2002. *Global Effects of Accelerated Tariff Liberalization in the Forest Sector to 2010.* USDA PNW-RP-534.

List of NWFP of commercial significance

Category	Key products	Examples of trade data ¹³⁶
Food products	1. <u>Nuts</u> . Brazil nuts, pine nuts, pignolia nuts, malva nut, walnuts and chestnuts.	<u>Brazil nuts (HS080120)</u> : Export of 35 149 t worth US\$51 Mio in 2001. Main exporting countries are Bolivia, Brazil and Peru; main importers are USA/PR/USVI, UK and Germany.
	2. <u>Fruits</u> . Jujube, sapodilla and Ginkgo.	Total annual production of <u>ginkgo</u> is around 5,000 tonnes, most of which is exported at a value of about 7 million US dollars (FAO1993). China is the only country known to be exporting <u>jujube</u> fruits. Annual output of fresh jujube is 400,000 tonnes. China exports about 4,700 tonnes of dry jujube, earning a foreign exchange of 5 million US\$ annually (FAO1993)
	3. <u>Edible fungi</u> . Morels, truffles and pine mushrooms.	<u>Morels</u> : Total world production is estimated to be approximately 150 tonnes worth US\$50-60 Mio. Pakistan and India are the main producing countries, each producing about 50 tonnes of dry morels annually (equivalent to fresh morels of 500 tonnes), all of which is exported (FAO, 1995)
	4. <u>Vegetables</u> . Bamboo shoots, osmunds, reindeer moss and palm hearts.	<u>Palm hearts (HS200891)</u> : Export of 38 726 t worth US\$70 Mio in 2001. Main exporting countries are Ecuador, Costa Rica and Brazil; main importers are France, Argentina and USA/PR/USVI. <u>Bamboo shoots</u> : Value of bamboo shoots exported from China reached US\$157 Mio, including bamboo shoots in brine, dried, canned/water cooked and canned/other (FAO, 2003b)
	5. <u>Starches</u> . Sago.	<u>Sago</u> : During 1991, Indonesia, the major producing and exporting country exported 10 108 tonnes of sago flour and meal to Japan, Hong Kong and Singapore, valuing US\$ 2.32 million (fob) (FAO, 1995).
	6. Birds' nests.	<u>Salanganes' or birds' nests</u> : Malaysia is the major producer and exporter of birds' nests. Malaysian exports during 1991 totalled 18.6 tonnes, mainly to Hong Kong, Singapore, Japan and China (Taiwan), valuing Malaysian \$ 2.93 million.
	7. <u>Oils</u> . Shea nuts, babassu oil, sal or tengkawang or illipe oil.	<u>Shea nuts (HS120792)</u> : Export of 31 783 t worth US\$4 Mio in 2001. Main exporting countries are Benin, Burkina Faso and Tanzania; main importers are Togo, Sweden and Denmark.
	8. Maple sugar and syrup.	<u>Maple sugar and syrup (HS170220)</u> : Export of 30 392 t worth US\$91 Mio in 2001. Main exporting countries are Canada, USA and Germany; main importers are USA, Japan and Germany.

¹³⁶ If not specified, data is based on figures provided by the United Nations Statistics Division commodity trade database (Comtrade) as of 26 September 2003. Main exporting countries are ranked according to the export value.

Spices, condiments and culinary herbs	1. Nutmeg and mace.	<u>Nutmeg (HS090810)</u> : Export of 16 645 t worth US\$68 Mio in 2001. Main exporting countries are Indonesia, Grenada and the Netherlands*; main importers the Netherlands, Germany and India.
	2. Cinnamon and cassia.	<u>Cinnamon and cinnamon-tree flowers, whole (HS090610)</u> : Export of 111 642 t worth US\$91 Mio in 2001. Main exporting countries are Sri Lanka, China and Indonesia; main importers are Mexico, USA/PR/USVI and India. <u>Cinnamon and cinnamon-tree flowers, crushed or ground (HS090620)</u> : Export of 4 785 t worth US\$8 Mio in 2001. Main exporting countries are Netherlands, Germany and USA/PR/USVI, main importers are Japan, USA and Canada.
	3. Cardamom.	<u>Cardamom (HS090830)</u> : Export of 22 215 t worth US\$138 Mio in 2001. Main exporting countries are Guatemala, Singapore and India; main importers are Saudi Arabia, United Arab Emirates and Singapore.
	4. Bay leaves	<u>Thyme and bay leaves (HS091040)</u> : Export of 24 425 t worth US\$38 Mio in 2001. Main exporting countries are Turkey, Spain and Germany, main importers are USA, Germany and UK.
	5. Other products	Galanga . Allspice . Caraway Oregano, etc.
Industrial plant oils and waxes	Tung oil, neem oil, jojoba oil, kemiri or candle or lumbang oil, and kapok oils, carnauba wax.	<u>Kapok Oil</u> , Total world production is 35721 mt and the export is only 416mt and the value of this is USD 288 000. (FAOSTAT 2003)
Plant gums	1. <u>Gums for food uses</u> . Gum arabic, gum tragacanth, gum karaya, carob gums.	<u>Gum arabic (HS130120)</u> : Export of 54 792 t worth US\$84 Mio in 2001. Main exporting countries are France, Sudan and UK; main importers USA, France and Germany. USA, Japan and Germany. 96 percent of the total world production of gum arabic in 1998 came from Sudan (23 030 t), Chad (12 887 t) and Nigeria (3 822 t) (FAO, xxx, Coppen).
	2. <u>Technological grade gums</u> . Talha and combretum gums.	<u>Gum talha</u> : A water soluble gum derived from a number of <i>Acacia</i> species like <i>A. seyal</i> , <i>A. sieberana</i> , <i>A. hockii</i> , <i>A. ehrenbergiana</i> and <i>A. karroo</i> . Production remains fairly constant at around 6 000 tonnes per annum (Anderson, 1993). About 3 000 to 5 000 tonnes are exported annually, mainly from Sudan
		<u>Natural gum, resin, gum-resin, balsam, not gum Arabic (HS130190)</u> : Export of 92 973 t worth US\$178 Mio in 2001. Main exporting countries are India, USA and Indonesia; main importers are India, France and UK.
Natural	Annatto	<u>Annatto</u> : International trade in annatto seeds and extracts is 7 000 – 9 000 t, calculated in seed equivalents. Main exporting

pigments	seeds, logwood, indigo.	countries are Peru and Kenya; main importers are USA, Western Europe and Japan (FAO, 1995b).
Oleoresins	Pine oleoresin, gum, wood or sulphate turpentine oils and other terpenic oils.	Total annual world export is around 1 Mio t. of rosin (50% gum rosin, 20% oil rosin, 8% wood rosin) Main rosin exporting countries are China, USA, Indonesia and Portugal; main turpentine exporting countries are Indonesia, Portugal and China (FAO, 2003b).
	2. Copal, damar, gamboge, benzoin gum, dragon's blood (Benjamin), and copaiba oil.	<u>Benzoin</u> : Export of about 4 600 t in 1995. Main exporting countries are Singapore (3 411 t worth US\$2.3 Mio), Indonesia (1 156 t worth US\$1.4 Mio) and Lao PDR (51.3 t) (FAO, 2001 see http://www.fao.org/DOCREP/005/AC776E/ac776e00.htm#Contents).
	3. Other products	Amber
Fibres and flosses	1. <u>Fibres</u> . Bamboo, rattan, xateattap, aren, osier, raffia, toquilla straw products, cork, esparto, erica and other broom grasses.	Total export of rattan and bamboo products (HS 460110, 460120, 460191, 460210, 940150, 940380) worth US\$2.4 billion in 2000 (Lobovikov, 2003). <u>Rattan used primarily for plaiting (HS140120)</u> : Export of 100.55 t worth US\$34 Mio in 2001. Main exporting countries are Singapore, Indonesia and China; main importers are China, Singapore and USA. <u>Bamboos used primarily for plaiting (HS140110)</u> : Export of 117.94 t worth US\$29 Mio in 2001. Main exporting countries are China, Indonesia and Germany; main importers are USA, Japan and China HKSAR. <u>Cork</u> : Total world production is estimated to be 250 000 t per annum, of which about 50% is produced in Portugal, 25% in Spain, and remaining 25% in Italy, France, Morocco, Algeria and Tunisia. Portugal, Spain and Morocco are the major exporting countries; EC and USA being major markets (FAO, 1995). Total trade in cork products reached 149 184 t worth US\$835.9 Mio in 2001.
	2. <u>Flosses</u> . Kapok or silk cotton.	<u>Kapok (HS140210)</u> : Export of 2 775 t worth US\$2.7 Mio in 2001. Main exporting countries are Indonesia, Thailand and USA*; main importers are Japan, China and China HKSAR. (FAO 2003a)
Vegetable tanning materials	Quebracho, mimosa, chestnut and catha/cutch.	Total value of world's trade in tannin extracts of vegetable origin (HS 3201) reached US\$123.3 Mio in 1991. During 1991, 50% of the world's supplies of vegetable tannin extracts originated from Argentina (34%) and Brazil (16%); main importers were USA, Italy, former USSR and Japan (FAO, 1995) <u>Raw vegetable materials for dyeing or tanning (HS140410)</u> : Export of 34 257 t worth US\$34 Mio in 2001. Main exporting countries are Indonesia, India and Peru; main importers are

		<p>Mexico, Japan and Saudi Arabia.</p> <p><u>Wattle tanning extract (HS320120)</u>: Export of 74 205 t worth US\$44 Mio in 2001. Main exporting countries are Brazil, south Africa and Zimbabwe; main importers are India, Italy and Mexico.</p> <p><u>Vegetable tanning extracts nes, tannins, salts, derivs (HS320190)</u>: Export of 32 616 t worth US\$50 Mio in 2001. Main exporting countries are Italy, USA and Indonesia; main importers are India, Italy and China.</p>
Latex	Natural rubber, gutta percha, jelutong, sorva and chicle.	<p><u>Natural rubber</u>: Thailand, Indonesia and Malaysia are the world's leading exporting countries in natural rubber "HS 400110 – 400211". The world total export value is around USD 3.5 year 2001(comtrade 2001) Entire production of natural rubber in these countries, however, comes from plantations. Separate statistics on rubber extracted from wild sources, however, is not available. The EC, USA and Japan are the major markets (FAO, 1995).</p> <p><u>Balata. Gutta-percha, guayule, chicle and similar gums (HS400130)</u>: Export of 3 330 t worth US\$8 Mio in 2001. Main exporting countries are Singapore, Spain and Sweden; main importers are USA, Japan and Korea Rep.</p>
Insect products	1. Natural honey.	<u>Natural honey (HS040900)</u> : Export of 353 657 t worth US\$426 Mio in 2001. Main exporting countries are China, Argentina and Germany; main importers are Germany, USA and Japan.
	2. Beeswax.	<u>Beeswax, other insect waxes and spermaceti (HS152190)</u> : Export of 10 359 t worth US\$36 Mio in 2001. Main exporting countries are China, Brazil and USA; main importers are Germany, USA and France.
	3. Lac and lac-dye.	<u>Shellac</u> : Thailand and India dominate world trade, each exporting, on an average, about 6 000 t per annum. Major markets are Germany, Italy, Egypt, Indonesia and USA (FAO, 1995).
	4. <u>Silk</u> . Mulberry and non-mulberry silks	<u>Silk</u> , the value of the silk export is 34 825 mt 2000, the annual growth in silk export has been 1.8% between 1990-2000China is the dominate export country in the world (FAO 2002b)
	5. Cochineal	Total world production of <u>cochineal</u> , though fluctuating, is estimated at 150 to 180 tonnes per year. Total demand is also in the same range. Peru is the biggest producer, accounting for 90% of the total production. <i>Peru</i> : production of 500 tonnes of cochineal in 1993; export of 77 tonnes of carmine valued at US\$6 700 000 in 1993.(FAO 1993)
	6 And other products	Aleppo galls. Kermes
Incense woods	Sandalwood, gharu or aloewood.	<u>Gharu (argawood, eaglewood)</u> : Reported global trade in gharu provided by <i>Aquilaria malaccensis</i> reached 700t in 1997. Main producing countries are Indonesia and Malaysia. Gharu chips and segments may be worth several hundred to several thousand US\$/kg (TRAFFIC, 2000).

Essential oils	Essential oils of bergamot, orange, lemon, lime, citrus fruits, nes, geranium, jasmine, lavender or of lavandin, peppermint, other mints, vetiver	World trade is of the order of US\$ 1 billion (comtrade 2001), including both the wild as well as cultivated sources. China, Indonesia, Thailand, India and Brazil are the major suppliers of some of the oils. The EC, USA and Japan are the principal import markets, accounting for 72% of the total world imports (FAO, 1995). <u>Plants & parts, pharmacy, perfume, insecticides use nes (HS121190)</u> : Export of 517 030 t worth US\$660 Mio in 2001. Main exporting countries are China, India and Germany; main importers are USA, India and Germany.
Plant insecticides	Pyrethrum, derris, medang and peauk bong.	<u>Plants & parts, pharmacy, perfume, insecticides use nes (HS121190)</u> : see “essential oils”. <u>Pyrethrum, roots containing rotenone, extracts (HS130214)</u> : Export of 449 t worth US\$20 Mio in 2001. Main exporting countries are Kenya, Australia and USA; main importers are USA, Germany and Italy.
Medicinal plants	Ginseng	The number of plant species used for medicinal purposes is more than 50 000, out of which around 2 500 are commercialised on the international level (Schippmann et al., 2003). The 12 leading countries of export of medicinal and aromatic plants exported in 1998-1998 281 550 t per year worth US\$ 643 million. Main exporting countries are China, India and Germany. Main importer of medicinal and aromatic plants (342 550 t worth US\$ 1 billion in 1981-1998) is the EU (Schippmann et al., 2003). The world market for herbal products based on traditional knowledge is estimated to be worth US\$60 000 million (WHO, 2002). <u>Ginseng roots (HS121120)</u> : Export of 9 813 t worth US\$167 Mio in 2001. Main exporting countries are China, Canada and Korea Rep; main importers are China HK, China and Asia OTHERS. <u>Plants & parts, pharmacy, perfume, insecticides use nes (HS121190)</u> : see “essential oils”.
Animals and animals' products	Ivory, trophies, bones, feathers, maleo eggs, butterflies, live animals and birds.	<u>Ivory, unworked or simply prepared, powder and waste (HS050710)</u> : Export of 33 t worth US\$ 4 Mio in 2001. Main exporting countries are Hungary, Tanzania and Canada; main importers are Austria, Hongkong and China.
Miscellaneous products	1. Lacquer.	<u>Lacquer</u> covers a total of 500,000 hectares with an annual production of 3,219 tons (1994). Raw lacquer is a traditional export product, e.g.: 300 tons/year during 1980-1986, mostly to Japan, Hong Kong, Macao and the United Kingdom. (FAO 1997)
	2. And other products	Dom nuts or ivory nuts. Chewing sticks. Betel and cola nuts. Quillaia bark. Soap berries (soap nut). Bidi leaves.

ANNEX 2

UNCTAD Coding System for TRADE Control Measures

1000 TARIFF MEASURES

- 1100 STATUTORY CUSTOMS DUTIES
- 1200 MFN DUTIES
- 1300 GATT CEILING DUTIES
- 1400 TARIFF QUOTA DUTIES
 - 1410 Low duties
 - 1420 High duties
- 1500 SEASONAL DUTIES
 - 1510 Low duties
 - 1520 High duties
- 1600 TEMPORARY REDUCED DUTIES
- 1700 TEMPORARY INCREASED DUTIES
 - 1710 Retaliatory duties
 - 1720 Urgency and safeguard duties
- 1900 PREFERENTIAL DUTIES UNDER TRADE AGREEMENTS
 - 1910 Interregional agreements
 - 1920 Regional and subregional agreements
 - 1930 Bilateral agreements

2000 PARA-TARIFF MEASURES

- 2100 CUSTOMS SURCHARGES
- 2200 ADDITIONAL CHARGES
 - 2210 Tax on foreign exchange transactions
 - 2220 Stamp tax
 - 2230 Import licence fee
 - 2240 Consular invoice fee
 - 2250 Statistical tax
 - 2260 Tax on transport facilities
 - 2270 Charges for sensitive product categories
 - 2290 Additional charges n.e.s.
- 2300 INTERNAL TAXES AND CHARGES LEVIED ON IMPORTS
 - 2310 General sales taxes
 - 2320 Excise taxes
 - 2370 Charges for sensitive product categories
 - 2390 Internal taxes and charges levied on imports
- 2400 DECREED CUSTOMS VALUATION
- 2900 PARA-TARIFF MEASURES N.E.S.

NON-TARIFF MEASURES (NTMs)

3000 PRICE CONTROL MEASURES

- 3100 ADMINISTRATIVE PRICING
 - 3110 Minimum import prices
 - 3190 Administrative pricing n.e.s.
- 3200 VOLUNTARY EXPORT PRICE RESTRAINT
- 3300 VARIABLE CHARGES
 - 3310 Variable levies
 - 3320 Variable components
 - 3330 Compensatory elements
 - 3340 Flexible import fees
 - 3390 Variable charges n.e.s.
- 3400 ANTIDUMPING MEASURES
 - 3410 Antidumping investigations
 - 3420 Antidumping duties
 - 3430 Price undertakings
- 3500 COUNTERVAILING MEASURES
 - 3510 Countervailing investigations
 - 3520 Countervailing duties
 - 3530 Price undertakings
- 3900 PRICE CONTROL MEASURES N.E.S.

4000 FINANCE MEASURES

- 4100 ADVANCE PAYMENT REQUIREMENTS
 - 4110 Advance import deposit
 - 4120 Cash margin requirement
 - 4130 Advance payment of customs duties
 - 4170 Refundable deposits for sensitive product categories
 - 4190 Advance payment requirements n.e.s.
- 4200 MULTIPLE EXCHANGE RATES
- 4300 RESTRICTIVE OFFICIAL FOREIGN EXCHANGE ALLOCATION
 - 4310 Prohibition of foreign exchange allocation
 - 4320 Bank authorization
 - 4390 Restrictive official foreign exchange allocation n.e.s.
- 4500 REGULATIONS CONCERNING TERMS OF PAYMENT FOR IMPORTS
- 4600 TRANSFER DELAYS, QUEUING
- 4900 FINANCE MEASURES N.E.S.

5000 AUTOMATIC LICENSING MEASURES

- 5100 AUTOMATIC LICENCE
- 5200 IMPORT MONITORING
 - 5210 Retrospective surveillance
 - 5220 Prior surveillance
 - 5270 Prior surveillance for sensitive product categories
- 5700 SURRENDER REQUIREMENT
- 5900 AUTOMATIC LICENSING MEASURES N.E.S.

- 6000 QUANTITY CONTROL MEASURES**
 - 6100 NON-AUTOMATIC LICENSING
 - 6110 Licence with no specific ex-ante criteria
 - 6120 Licence for selected purchasers
 - 6130 Licence for specified use
 - 6131 Linked with export trade
 - 6132 For purposes other than exports
 - 6140 Licence linked with local production
 - 6141 Purchase of local goods
 - 6142 Local content requirement
 - 6143 Barter or counter trade
 - 6150 Licence linked with non-official foreign exchange
 - 6151 External foreign exchange
 - 6152 Importers' own foreign exchange
 - 6160 Licence combined with or replaced by special import auth
 - 6170 Prior authorization for sensitive product categories
 - 6190 Non-automatic licensing n.e.s.
 - 6200 QUOTAS
 - 6210 Global quotas
 - 6211 Unallocated
 - 6212 Allocated to exporting countries
 - 6220 Bilateral quotas
 - 6230 Seasonal quotas
 - 6240 Quotas linked with export performance
 - 6250 Quotas linked with purchase of local goods
 - 6270 Quotas for sensitive product categories
 - 6290 Quotas n.e.s.
 - 6300 PROHIBITIONS
 - 6310 Total prohibition
 - 6320 Suspension of issuance of licences
 - 6330 Seasonal prohibition
 - 6340 Temporary prohibition
 - 6350 Import diversification
 - 6360 Prohibition on the basis of origin (embargo)
 - 6370 Prohibition for sensitive product categories
 - 6390 Prohibitions n.e.s.
 - 6600 EXPORT RESTRAINT ARRANGEMENTS
 - 6610 Voluntary export restraint arrangements
 - 6620 Orderly marketing arrangements
 - 6630 Multifibre arrangement (MFA)
 - 6631 Quota agreement
 - 6632 Consultation agreement
 - 6633 Administrative cooperation agreement
 - 6640 Export restraint arrangements on textiles outside MFA
 - 6641 Quota agreement
 - 6642 Consultation agreement
 - 6643 Administrative cooperation agreement
 - 6690 Export restraint arrangements n.e.s.
 - 6700 ENTERPRISE-SPECIFIC RESTRICTIONS
 - 6710 Selective approval of importers
 - 6720 Enterprise-specific quota
 - 6790 Enterprise-specific restrictions n.e.s.
 - 6900 QUANTITY CONTROL MEASURES N.E.S.

7000 MONOPOLISTIC MEASURES

- 7100 SINGLE CHANNEL FOR IMPORTS
 - 7110 State trading administration
 - 7120 Sole importing agency
- 7200 COMPULSORY NATIONAL SERVICES
 - 7210 Compulsory national insurance
 - 7220 Compulsory national transport
- 7900 MONOPOLISTIC MEASURES N.E.S.

8000 TECHNICAL MEASURES

- 8100 TECHNICAL REGULATIONS
 - 8110 Product characteristics requirements
 - 8120 Marking requirements
 - 8130 Labelling requirements
 - 8140 Packaging requirements
 - 8150 Testing, inspection and quarantine requirements
 - 8190 Technical regulations n.e.s
- 8200 PRE-SHIPMENT INSPECTION
- 8300 SPECIAL CUSTOMS FORMALITIES
- 8900 TECHNICAL MEASURES N.E.S.

US Local Legislation to Restrict Tropical Timber

State	Area	Date	Status	Restriction
Arizona	State	1990	Enacted & replaced	Ban of use of endangered (specific on teak, ebony, mahogany, lauan)
Arizona	State	1997	Enacted	Ban of all endangered species on CITES Appendix I
California	State	1992	Vetoed	Ban of tropical timber in state funded projects
California	Santa Clarita	1991	Enacted	Ban of tropical woods
California	Berkeley	1990	Enacted	Ban of city purchases of wood from rainforest. Statement by contractors.
California	San Francisco	1990	Enacted	Ban of tropical woods
California	Los Angeles	1995	Enacted	Only FSC certified tropical hardwood allowed
Hawaii	Honolulu	1993	Proposal	Ban of tropical wood
Maryland	State	1992	Not scheduled	Restriction on government purchase of tropical wood
Massachusetts	Commonwealth	2000	Pending	Restrictions in state purchases of tropical rainforest products
Minnesota	Minneapolis	1992	Defeated	Ban of tropical hardwood use and sales within city limits
New Jersey	Atlantic City	1996	Enacted	Sustainability verification required by certification
New Jersey	State	1994 1996	Pending	Sustainability verification required by certification
New Jersey	State	2001	Pending	Sustainability verification required by FSC certification
New York	City	1997	Pending	Ban of tropical wood except FSC certified
New York	City	2002	Pending	Procurement preference according to FSC principles and criteria
New York	State	1991	Enacted	Identification needed that wood is not endangering rainforest
New York	State	2001	Pending	Further requirement of verification of sustainable forest management
Pennsylvania	Harrisburg	1991	Enacted	Ban on tropical wood
Pennsylvania	State	1997	Pending, 4 th time	Ban on tropical wood except as verified sustainable via certification
Rhode Island	State	1993	Pending	Ban on tropical wood

Source: IWPA, various sources, consultant archives

Tree Species Subject to CITES Regulations (as of Jan. 2002)

Scientific name	Common name	Native region
Appendix I		
<i>Abies guatemalensis</i>	Guatemalan fir	Central America
<i>Araucaria araucana</i> (Chile only)	Monkey-puzzle tree	Argentina, Chile
<i>Balmea stormiae</i>	Ayuque	Central America, Mexico
<i>Dalbergia nigra</i>	Brazilian rosewood	Brazil
<i>Fitzroya cupressoides</i>	Alerce	Argentina, Chile
<i>Pilgerodendron uviferum</i>	Pilgerodendron	Argentina, Chile
<i>Podocarpus parlatorei</i>	Parlatore's Podocarp	Argentina, Bolivia, Peru
Appendix II		
<i>Aquilaria malaccensis</i>	Agarwood	S. Asia - S.E. Asia
<i>Caryocar costaricense</i>	Ajo, garlic tree	Costa Rica, Panama
<i>Guaiaacum officinale</i>	Commoner lignum vitae	South America, Caribbean
<i>Guaiaacum sanctum</i>	Hollywood lignum vitae	Central America
<i>Oreomunnea pterocarpa</i>	Gavilan	Central America, Mexico
<i>Pericopsis elata</i>	Afromosia	West Africa
<i>Platymiscium pleiostachyum</i>	Cristobal, Granadillo	Costa Rica, Panama
<i>Prunus africana</i>	African cherry	Tropical Africa, Madagascar
<i>Pterocarpus santalinus</i> ¹	Redsander	India
<i>Swietenia humilis</i>	Mexican mahogany	Central America
<i>Swietenia mahagoni</i>	Caribbean mahogany	Caribbean
<i>Taxus wallichiana</i> ²	Himalayan yew	S. Asia
Scientific name	Common name	Country ³
Appendix III		
<i>Podocarpus neriifolius</i>	Oleander-leafed podocarp	Nepal
<i>Talauma hodgsonii</i>	Hodgson's talauma	Nepal
<i>Tetracentron sinense</i>	Tetracentron	Nepal
<i>Swietenia macrophylla</i>	Big-leaf mahogany	Costa Rica, Bolivia, Brazil, Mexico, Peru, Columbia
<i>Thymelaeaceae gonystylus spp.</i>	Ramin	Indonesia
<i>Cedrela odorata</i>	Spanish Cedar	Peru, Columbia

¹ Exemptions made for finished musical instruments, formulations, and chemical derivatives.

² Exemptions made for medicinal products.

³ Denotes country where species is voluntarily listed. Export of species must be accompanied by CITES permit only for country listed. Exports from other countries need only be accompanied by official certificate of origin.

ANNEX 5

DEFINITIONS

Market Performance. When investigating the market developments, *ex post*, the trends and fluctuations are a net result from a large number of factors. The most important ones are related to the comparative advantage differences of industrial locations, and competitiveness differences of operators. Market access factors and variation in them are just one group of factors in the matrix.

Market Access. In general terms, market access can be described as the conditions under which producers are able to offer products for sale. These conditions are the consequences of decisions by importers and exporters, and also a consequence of the inherent characteristics of the sector and products. Ideal conditions of the producers and sellers to provide free access to the market to offer the goods for sale. Free market access is equivalent with no barriers to trade. (Even in the conditions of free market access there may exist constraints to market entry. An example is high investment requirements to establish production or distribution networks).

Barriers to Trade. Barriers to trade are (usually national government) policies or actions that interfere with free market buying and selling of goods and services internationally. Both tariff barriers and non-tariff barriers (NTBs) to trade have been used (see non-tariff measures below). As the tariffs have been reduced, the NTBs present the main threat to open world markets and potential efficiency gains from trade. (Impediment. Obstruction, hindrance, restriction, usually in a meaning of a lesser constraint than a barrier).

Forest Governance. Governance concerns all forests, including the forests of temperate and boreal regions. In the tropical forestry, a large number of other instruments complement the legally binding ones. One intends to cover the whole by calling it the (tropical) forest governance. Here used in a meaning to cover forest sector policy, forest legislation, harvesting code, sustainable forest management rules, criteria and indicators for sustainability. In a broad sense it covers the rules, including decision making structure, that control forest management, as well as timber production, processing and trade. (Governance. Exercise of authority or control. A method or system of government and/or management).

International Trade Regime. This is a concept covering the full range of legal instruments to regulate the trade. There are excellent reasons to have a wide regime to be used to enhance the positive and to eliminate the negative aspects of international trade. Especially in tropical timber trade, the complementary instruments are in need, as no one single comprehensive legal instrument exists on forests.

Tariff. Discriminatory tariffs have the effect of artificially creating an advantage for one type of product over the other, which has been disadvantaged. If the tariff is computed on an *ad valorem* basis, higher freight cost would further accentuate the degree of discrimination. Tariff is linked in certain cases to an arrangement such as the generalized system of preferences (GSP) or duty-free quota, which could be looked at as part and parcel of the tariff structure. Import tariff on imported tropical timber makes it less competitive.

Tariff escalation; Higher tariffs for further processed products. This is particularly relevant for tropical timber, given the range of products from logs to basic and secondary processed wood products. It is also relevant in the sense that tariff escalation could adversely affect tropical log producers aspiring for more efficient use of raw materials.

Non-tariff measures (NTM). Laws, regulations, policies and practices that either protect domestically produced goods from the full weight of foreign competition, or artificially

stimulate the exports of particular domestic products. The NTMs include both formal institutional measures designed to restrict or distort trade pattern, and other restrictions that act as impediments to trade. NTMs include standards *e.g.* on health and plant protection.

Sustainable Forest Management (SFM). ITTO's (1998) definition is as follows: "Sustainable forest management is the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment."

Production and processing methods (PPMs). A concept, which is related to one key issue in the trade and environment regulations. The issue is about measures, which place distinctions on products, based on the processes and production methods used, as compared to distinctions based on the quality of the product as such.

Technical Barriers to Trade (TBTs). TBTs set out procedures for ensuring that technical regulations and standards, including packaging, marking and labeling requirements, do not create "unnecessary obstacles to international trade". The TBT agreement seeks to ensure that product standards are not used as disguised protectionist measures, and to reduce the extent to which they act as barriers to market access.

Economic distance is closely related to market access. Some, but not all of the components of economic distance are unavoidable. The economic distance between two trading partners can be defined as follows:

$$[1] \quad \text{Economic distance} = \text{Insurance} + \text{freight} + \text{tariffs} + \text{NTMs} + \text{transaction cost}$$

Transaction costs can be decomposed as follows:

$$[2] \quad \text{Transaction costs} = \text{Cost of necessary and efficient procedures} \\ + \text{Cost of unnecessary or inefficient procedures} \\ + \text{Cost of corruption.}$$

ANNEX 6a Tariff Rates for Forest Products in Selected Developed Countries

•	•	Australia		EU		Japan		USA		Canada		New Zealand	
		MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP
44													
44.01	Chips and particles	5	0	0	0	0	0	0	0	0	0	0	0
44.03	Wood in rough (i.e. logs) whether or not roughly ...	0.5		0	0	0	0	0	0	0	0	0	0
44.07	Wood sawn lengthwise sliced or peeled or planed	0-5	0-4	0 (C) 0-2.5	0	4.8-7 7.6 (C)	0	0	0	0	0	0.7	5.5
44.08	Veneer	0.5	0	3.4(C)	0	5	0.2.5	0	0	0	0.6.5.7	5.5.5	
44.09	Wood-tongued, grooved, beadings, mouldings etc.	5	4	0.0		4.1-6.3	0	0.4.9	0	0.3.5	0	0.5	4
44.10	Particleboard and similar	5		7	4.9	6.3	0	0	0	0.2.5	0	5	4
44.11	Fibreboard	5	4.5	7	4.9	2.8-3.6	0	0	0	0.6	0	5	4
44.12	Plywood and laminated wood	5	4.5	6-10	4.2-7	7.5 (C) 7.4-12	0.6 (C) 0-10	0-8 (C) 0-8	0	9.5 (C) 0.5	3 (C) 0.3	7	5.5
44.15	Packing cases, drums, pallets etc.	5	4	3	0	3.4-4.7	0	0.10.7	0	0.9.5	0.3.5	0.7	5.5
44.18	Builders' joinery and carpentry	5	4	0-3	0-2.1	2.8-6.3	0	0-4.8	0	0-8	0	6.5	5
47													
47.01	Wood pulp (mechanical)			0		0	0	0	0	0	0	0	
47.02-05	Wood pulp (chemical)			0		0	0	0	0	0	0	0	
47.07	Waste paper			0		0	0	0	0	0	0	0	
48													
48.01	Newsprint	5		2.5	0	0	0	0	0	0	0	0-6.5	5
48.04	Uncoated kraft paper in rolls or sheets	5	0-5	3.5	0	1.8-2.5	0	0	0	0	0	0-7	5.5
48.08	Corrugated paper and board in rolls or sheets	0.5		6.10	0	2.4-2.9	0	0-5	0	0	0	7	5.5
48.10	Coated paper (printing) in rolls or sheets	0.5		7.2	0	2.9	0	0	0	0	0	0-6.7	5
94													
94.01	Seats with wooden frames	5		0		0	0	0	0	0.9.5	0-6	7	5.5
94.03	Furniture of wood	5		0-2.7	0	0	0	0	0	0.9.5	0	7	5.5
MFN	Most Favoured Nation			(C)	Coniferous	(T)	Tropical						
GSP	Generalized System of Preferences			(NC)	Non-coniferous								

ANNEX 6b Tariff Rates for Forest Products in Selected Developing Countries

		China	India	Indonesia	Malaysia	Thailand	Chile	S. Africa	Brazil	Mexico	Taiwan
44											
44.01	Chips and particles	0	5	0	2	20	1	7	4.5	10	0
44.03	Wood in rough (i.e. logs) whether or not roughly	0	5	0	2	0	1	7	4.5	10	0
44.07	Wood sawn lengthwise sliced or peeled or planed	0	25	0-10	5	0	1.5	7	8.5	10.15	0
44.08	Veneer	5-8	35	5	5	0.20	10	7	8.5	10	0
44.09	Wood-tongued, grooved, beadings, mouldings etc	15	35	0	8	20	20	7	12.5	10.20	0
44.10	Particleboard and similar	16, 18	35	5	8	20	20	7	12.5	15.20	0.3
44.11	Fibreboard	11-18	35	5, 10	8	20	20	7	12.5	15	3.5
44.12	Plywood and laminated wood	15	35	15	8	25-40	20	7	12.5	18 (C) 23 (NC)	4-15 (C) 10, 15
44.15	Packing cases, drums, pallets etc	10	35	10	8	20	20	7	12.5	23	2
44.18	Builders' joinery and carpentry	16	35	15	8	20	20	7	16.5	23	2
47	PULP AND WASTE PAPER										
47.01	Wood pulp (mechanical)	0	5	0	0	0	5	7	6.5	5	0
47.02-05	Wood pulp (chemical)	0	5	0	0.2	0	5	7	6.5	3.5	0.1
47.07	Waste paper	0	5	0.20	2	0	1	7	6.5	3	0
48											
48.01	Newsprint	3-45	15	5	7.5	5	10	7	12	18	0
48.04	Uncoated kraft in rolls or sheets	10, 15	35	0-10	3-7.5	0.15	10	7	16.5	13	4.5
48.08	Corr. paper and board etc. in rolls or sheets	12	35	10	7.5	15.25	10	7	14.5	13	2.2-5
48.10	Coated paper (printing) in rolls or sheets	15	35	0-10	7.5	0-15	10	7	16.5	13	5, 6.3
94											
94.01	Seats with wooden frames				8	30	20	7	20.5	18	
94.03	Furniture of wood	22	35	10-20	8	30	20	7	20.5	23.25	1.25-10
(T)	Tropical	(C)	Coniferous	(NC)	Non-coniferous						

